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ECONOMIC THEORY AND AGRARIAN ECONOMICS

By N. GEORGESCU-ROEGEN

ACCORDING to some recent studies, more than 1·3 billion people still live in a self-subsistence economy, that is, as peasants. Most of these also live on the verge of starvation. Asia and Africa, which together represent more than 60 per cent. of the world's population, produce only a little more than 30 per cent. of the world's agricultural output. Conservative estimates show that if basic nutritional needs for the entire population of the world are to be met, it is necessary that the food production be increased by at least 30 per cent.[1] Neither the overwhelming numerical importance of peasant economy nor the scarcity of food is a new economic development peculiar to our own time.

In spite of all this, agrarian economics—by which I mean the economics of an overpopulated agricultural economy and not merely agricultural economics—has had a very unfortunate history. Non-capitalist economies simply presented no interest for Classical economists. Marxists, on the other side, tackled the problem with their characteristic impetuosity, but proceeded from preconceived ideas about the laws of a peasant economy. A less known school of thought—Agrarianism—aimed at studying a peasant economy and only this. An overt scorn for quantitative theoretical analysis prevented the Agrarians from constructing a proper theory of their particular object of study, and consequently from making themselves understood outside their own circle. There remain the Standard economists (as a recent practice calls the members of the modern economic school for which neither neo-Classical nor General Equilibrium suffices as a single label). Of late, as economic development has become tied up with precarious international politics, Standard economists have been almost compelled to come to grips with the problem of underdeveloped economies, and hence with non-capitalist economics. But in their approach they have generally committed the same type of error as Marxists.

Thus, the agrarian economy has to this day remained a reality without a theory. And the topical interest of a sound economic policy in countries with a peasant overpopulation calls for such a theory as at no other time in history. But one cannot aspire to present a theory of a reality as complex as the peasant economy within the space of an article. My far more modest aim is to point out the basic features that differentiate an

[1] The above data are found in W. S. and E. S. Woytinsky, *World Population and Production*, New York, 1953, pp. 307, 435 *passim*.

overpopulated agricultural economy from an advanced economy. I have endeavoured to present the argument in terms of the familiar analytical tools of Standard theory or others akin to these. The brief historical critique which prefaces the theoretical analysis is intended to place the latter in a better perspective, particularly as concerns policy implications.

I. Theory, Reality, and Policy

1. Theory and Reality. Theory is in the first and last place a logical file of our factual knowledge pertaining to a certain phenomenological domain.[1] Only mathematics is concerned with the properties of 'any object whatever', for which reason since Aristotle's time it has been generally placed in a special category by itself. To each theory, therefore, there must correspond a specific domain of the reality. In any science, the problem of precisely circumscribing this domain faces well-known difficulties. Where physics ends and chemistry begins, and where economics ends and ethics begins, are certainly thorny questions, although not equally so. Here, however, I want to discuss a quite pedestrian query pertaining to the problem of the proper domain of a theory. And this query is: Can an economic theory which successfully describes the capitalistic system, for instance, be used to analyse successfully another economic system, say feudalism?

Let us observe that a similar question hardly ever comes up in the physical sciences, for no evidence exists to make physicists believe that matter behaves differently today than yesterday. In contrast, we find that human societies vary with both time and locality. To be sure, one school of thought still argues that these variations are only different instances of a unique archetype and that consequently all social phenomena can be encompassed by a single theory. This is not the place to show precisely where the weakness of the various attempts in this direction lies. Suffice it to mention here that when the theories constructed by these attempts do not fail in other respects, they are nothing but a collection of generalities of no operational value whatever. As Kautsky once judiciously remarked, 'Marx designed to investigate in his "Capital" the capitalistic mode of production [and not] the forms of production which are common to all people, as such an investigation could, for the most part, only result in commonplaces.'[2] For an economic theory to be operational at all, i.e. to be capable of serving as a guide for policy, it must concern itself with a specific type of economy, not with several types at the same time.

What particular reality is described by a given theory can be ascertained

[1] That is not to deny that theory may serve other purposes, but these are by-products of its essential nature.

[2] Karl Kautsky, *The Economic Doctrines of Karl Marx*, New York, 1936, p. 1.

only from the latter's axiomatic foundation. Thus, Standard theory describes the economic process of a society in which the individual behaves *strictly* hedonistically, where the entrepreneur seeks to maximize his cash-profit, and where any commodity can be exchanged on the market at uniform prices and none exchanged otherwise. On the other hand Marxist theory refers to an economy characterized by class monopoly of the means of production, money-making entrepreneurs, markets with uniform prices for all commodities, and complete independence of economic from demographic factors.[1] Taken as abstractions of varying degree, both these axiomatic bases undoubtedly represent the most characteristic traits of the capitalist system.[2] Moreover, far from being absolutely contradictory, they are complementary, in the sense of Bohr's Principle of Complementarity.[3] This is precisely why one may speak of Marx as 'the flower of Classical economics'.[4]

A far more important observation is that the theoretical foundations of both Standard and Marxist theories consist of cultural or, if you wish, institutional traits. Actually, the same must be true of any economic theory. For what characterizes an economic system is its institutions, not the technology it uses. Were this not so, we would have no basis for distinguishing between Communism and Capitalism, while, on the other hand, we should regard Capitalism of today and Capitalism of, say, 50 years ago as essentially different systems.

As soon as we realize that for economic theory an economic system is characterized exclusively by institutional traits, it becomes obvious that neither Marxist nor Standard theory is valid as a whole for the analysis of a non-capitalistic economy, i.e. of the economy of a society in which part or all of the capitalist institutions are absent. A proposition of either theory may eventually be valid for a non-capitalistic economy, but its validity must be established *de novo* in each case, either by factual evidence or by logical derivation from the corresponding axiomatic foundation. Even the analytical concepts developed by these theories cannot be used indiscriminately in the description of other economies. Among the few that are of general applicability there is the concept of a production

[1] I refer to the fact that the assumption of a permanent reserve army simply means that at the subsistence wage-rate the supply of labour is 'unlimited' both in the short and in the long run, while Classical economics held that this was true only in the long run. *Infra*, p. 18 n.

[2] We have left out the surplus value proposition from the Marxist axioms because this proposition—as we shall argue later—belongs to feudalism, not to capitalism.

[3] This principle by which Bohr overcame the impasse created by the modern discoveries in physics states that reality 'cannot be comprehended in a single picture' and that 'only the totality of the phenomena exhausts the possible information about objects'. Niels Bohr, *Atomic Physics and Human Knowledge*, New York, 1958, pp. 40 *passim*.

[4] Terence McCarthy in the Preface to the English translation of K. Marx, *A History of Economic Theories*, New York, 1952, p. xi.

function together with all its derived notions. But this is due to the purely physical nature of that concept. Most economic concepts, on the contrary, are hard to transplant. 'Social class' seems the only exception, obviously because it is inseparable from 'society' itself (save the society of Robinson Crusoe and probably that of the dawn of the human species). This is not to say that Marxist and Standard theories do not provide us with useful patterns for asking the right kind of questions and for seeking the relevant constituents of any economic reality. They are, after all, the only elaborate economic theories ever developed.

All this may seem exceedingly elementary. Yet this is not what Standard and (especially) Marxist theorists have generally done when confronted with the problem of formulating policies for the agrarian overpopulated countries. And, as the saying goes, 'economics is what economists do'.

2. A Reality without Theory. As has often been remarked, economists of all epochs have been compelled by the social environment to be far more opportunistic than their colleagues in other scientific fields, with the result that their attention has been concentrated upon the economic problems of their own time.[1] And as the transition of economic science from the purely descriptive (i.e. taxonomic) to the theoretical stage coincided with the period during which in Western Europe feudalism was rapidly yielding to capitalism, it was only natural that the latter should become the objective of the first theoretical economists. That may explain only why most Western economists have been interested in developing the theory of the capitalist system, but not why none attempted a theory of a non-capitalist economy. The only explanation of this omission is the insuperable difficulty in getting at the cultural roots of a society other than that to which one actually belongs. And, as we have seen, an intuitive knowledge of the basic cultural traits of a community is indispensable for laying out the basis of its economic theory.

By its very nature, a peasant village is the milieu least fit for modern scientific activity. The modern scientist had therefore to make the town his headquarters. But, from there, he could not possibly observe the life of a peasant community. London, for instance, offers indeed 'a favorable view . . . for the observation of bourgeois society'—a circumstance immensely appreciated by Marx[2]—but not even a pinhole through which to

[1] The point finds an eloquent illustration in the vogue that the problem of economic development has recently acquired among Western economists: we have reached the point where the development of underdeveloped nations is as much an economic problem of the West as of these other nations.

[2] K. Marx, *A Contribution to the Critique of Political Economy*, Chicago, 1904, Preface, p. 14.

look at a peasant economy. Even if, unlike Marx, an economist was born in a village, he had to come to town for his education. He thus became a true townee himself, in the process losing most, if not all, *verstehen* of the peasant society. It was natural, therefore, that to Marx as well as to other Western economists (to those coming from a peasantless country, especially) the peasant should seem 'a mysterious, strange, often even disquieting creature'.[1] Yet none showed Marx's unlimited contempt for the peasantry. For him, the peasantry was just a bag of potatoes, not a social class. In the *Communist Manifesto* he denounced 'the idiocy of rural life' to the four corners of the world. But these Marxist hyperboles apart, there is, as we shall presently see, a spotless rationale behind Marx's attitude towards the peasant.

The difference between the philosophy of the industrial town and of the agricultural countryside has often attracted the attention of sociologists and poets alike.[2] But few have realized that this difference is not like going to another church, and that it involves every concrete act concerning production and distribution as well as social justice. Undoubtedly the basis of this difference is the fact that the living Nature imposes a different type of restriction upon *homo agricola* than the inert matter upon *homo faber*.

To begin with, no parallelism exists between the law of the scale of production in agriculture and in industry. One may grow wheat in a pot or raise chickens in a tiny backyard, but no hobbyist can build an automobile with only the tools of his workshop. Why then should the optimum scale for agriculture be that of a giant open-air factory? In the second place, the role of the time-factor is entirely different in the two activities. By mechanical devices we can shorten the time for weaving an ell of cloth, but we have as yet been unable to shorten the gestation period in animal husbandry or (to any significant degree) the period for maturity in plants. Moreover, agricultural activity is bound to an unflinching rhythm, while in manufacture we can well do tomorrow what we have chosen not to do today. Finally, there is a difference between the two sectors which touches the root of the much discussed law of decreasing returns (in the evolutionary sense). For industrial uses man has been able to harness one source of energy after another, from the wind to the atom, but for the type of energy that is needed by life itself he is still wholly dependent on the most 'primitive' source, the animals and plants around him. These brief observations are sufficient to pinpoint not only why the philosophy of the

[1] Karl Kautsky, *La Question agraire*, Paris, 1900, p. 3.

[2] In the Western literature, Oswald Spengler is probably the best known author for placing a great historical value upon this difference. See especially his *The Decline of the West*, New York, 1928, vol. ii, ch. iv.

man engaged in agriculture differs from that of the townee but also why agriculture and industry still cannot be subsumed under the same law. Whether future scientific discoveries may bring life to the denominator of inert matter is, for the time being, a highly controversial—and no less speculative—topic.

Probably the greatest error of Marx was his failure to recognize the simple fact that agriculture and industry obey different laws; as a result he proclaimed that the law of concentration applies equally well to industry and agriculture.[1] To repeat, Marx had no opportunity to observe a peasant economy. Nor is there anything in his vast literary activity to indicate that he ever studied a non-capitalist agriculture.[2] The analysis of rent in *Capital* is based entirely on capitalist production even during Marx's brief excursion into peasant agriculture.[3]

Probably no other theoretical aberration has been refuted by historical developments as promptly and as categorically as the Marxist law of concentration in agriculture. During the second half of the nineteenth century one census after another revealed that in agriculture concentration was continuously decreasing while the peasants instead of being proletarianized became landowners in increasing numbers. In Kautsky's own words, 'the capitalists were on the increase, not the proletarians'. The indictment was all the more unappealable since this phenomenon was taking place in capitalist countries without any planned intervention. That convinced everyone save the ultra-orthodox Marxists that the concentration law is false.

3. Policy and Factitious Theory. The aftermath of 'the sorest experience of Marxist doctrine'—as Veblen labelled the refutation of the concentration law[4]—can be best appraised in the light of the Hegelian tenet which is the cornerstone of the Marxist doctrine. To recall, according to that tenet it is beyond man's power to change the course of history. This is why Marx argued that socialism is to come as the natural product of the evolution of the relations of production, not because the interests of the working class would in any sense be superior to or more important than those of capitalists. Marx even scoffed at those who wanted to base a socialist platform on such 'unscientific' arguments as greater social justice. But, always according to the Marxist Hegelianism, man can speed up the historical process so as to shorten the periods of growing-pains. A right policy must be based on the acceptance of the inexorable outcome.

[1] K. Marx, *Capital*, Chicago, 1906, i, ch. xiv, sec. 10.

[2] Kautsky, *La Question agraire*, p. xii. Also F. Engels in the Preface to the third volume of *Capital* (Chicago, 1909, p. 16).

[3] Marx, *Capital*, iii, ch. xlvii, sec. 5.

[4] Thorstein Veblen, *The Place of Science in Modern Civilization*, New York, 1919, pp. 450 ff.

Because of the belief in the concentration law in agriculture, Socialists were advised to more than welcome any measure that would tend to proletarianize the peasants so that the advent of socialism would be hastened. But since the peasant did not want to hear of proletarianization, Socialist parties found themselves rejected everywhere by the peasant masses. Failures on the electoral front, combined with the mounting evidence against the Marxist theory, brought about the internal crisis known as the Agrarian Question. At the Frankfurt (1894) and Breslau (1895) congresses, the Question almost wrecked the unity of the party.[1] Even if officially this unity was then saved, the Question continued to make life difficult for Marxism. In the end Marx himself was obviously disturbed by the overwhelming evidence and the mounting criticism, for in the last two years of his life he painfully sought to amend his theory, but not so as to jeopardize the political movement which he had set in motion and to which he was attached from first to last.[2] But his desire was unrealizable, because contradictory. After Marx's death the party made great efforts to cover up the Agrarian Question. They vacillated between Leninist opportunism, by proclaiming loudly that no one intends to destroy the peasant, and various dialectic circumvolutions aimed at proving that there *is* concentration although in an entirely new sense.[3] The Agrarian Question was thus kept on a low flame until Stalin decided to solve it by proclaiming a holy war against the peasants, a war with which neo-Marxism has since become almost synonymous.

It is hard not to see in this momentous decision the ultimate product of Marx's scorn for the peasant. Indeed, this scorn constituted a lasting

[1] For the Agrarian Question one may consult Kautsky, *La Question agraire*, and G. Gatti, *Le Socialisme et l'agriculture*, Paris, 1902. The first work is important because it appeared only a few years after the Breslau Congress (German edition, *Die Agrarfrage*, Stuttgart, 1899), where Kautsky had a decisive role in defeating the 'deviationist' motion. Gatti, on the other hand, was a prominent Socialist who ultimately embraced the non-Marxist view on agriculture.

[2] Marx's public concession, though somewhat veiled, is found in the preface to the 1882 Russian edition of the *Communist Manifesto* (K. Marx and F. Engels, *Correspondence, 1846–1895*, New York, 1935, p. 355). A clearer expression of the deviation from 'the Marxist line' came in a letter Marx wrote in 1881 to Vera Zasulich in answer to a definite question regarding the necessity of speeding up the proletarianization of the Russian peasant. The letter, however, was published by the Marx–Engels Institute only in 1924, when the struggle between Russian Marxists and their adversaries was long since over. (D. Mitrany, *Marx Against the Peasant*, The University of North Carolina Press, 1951, pp. 31–33, was the first to draw the attention of the English-speaking reader to this letter.)

We know also that in his last years Marx decided to learn Russian (and apparently even Turkish) to have access to the original sources concerning the agrarian problems of Eastern Europe (*Correspondence*, p. 353). For more than one reason, it was too late.

[3] An epitome of these endeavours is offered by Kautsky, *La Question agraire*. He argued that, although the concentration law is not true as to the size of the holdings, it is true as to the global ownership, with more landowners having important outside sources of income. Then he threw everything overboard by arguing that peasant agriculture must disappear in any case because the optimum scale of production is that of latifundia.

ferment for the thinking of Marxist leaders. Quite early, none other than Engels spoke of the necessity for the proletariat 'to crush a general peasant uprising'.[1]

Be this as it may, the Stalinist war, which by its number of victims surpasses all other wars known to history, could not have found sufficient momentum in the cultural opposition between the urban and the rural sectors. Nor could this war feed on 'sacking the rich', for precisely in the regions where Stalinism has till now spread the capitalist-bourgeois class was paper-thin, and the rich peasant quite a rarity. The war must have had other springs.

That the interests of the town conflict with those of the countryside is by now a well-established fact. However, it is not always realized that the price-scissors do not tell the whole story. For this story, we must observe that food is indispensable, while the need for industrial products is secondary, if not superfluous. To obtain its foodstuff from the agricultural sector, and moreover to obtain it *cheaply*, constitutes a real problem for the industrial community. In the ultimate analysis, 'cheap bread' is a cry directed against the tiller of the soil rather than against the capitalist partner of the industrial worker. In some circumstances this conflict may become very spiny. And it is permanently spiny in the over-populated countries where the income of the masses allows only the satisfaction of the most elementary needs and where the population of the town is unduly swollen by a rural exodus. That has been the situation in all countries—with one or two exceptions—where Stalinism has come to power. And it is in this situation that the war against the peasant found its needed spring.[2]

Clearly, the Stalinist formula constitutes a solution (at least a temporary one) of the conflict between the industrial and agricultural sectors. But the solution is based on the primacy of the interests of the industrial and bureaucratic sections of the society, not on some evolutionary law regarding the inexorable proletarianization of the peasants.[3] Consequently

[1] Quoted in Mitrany, op. cit., p. 219.

[2] The conflict between the interests of the agricultural and industrial sectors exists also in the advanced economies, including the United States. Cf. J. D. Black, Discussion, *Proceedings of the Fifth International Conference of Agricultural Economists*, London, 1939, pp. 86 f. The only difference is that in these economies the conflict is attenuated by the high income, and therefore it can be resolved by such methods as the Agricultural Price Support Programme. Overpopulation is the necessary condition for the conflict to become a social *vis viva*.

[3] A London tailor, J. G. Eccarius, *Eines Arbeiters Widerlegung der nationalökonomischen Lehren John Stuart Mills*, Zurich, 1868, was the first to argue that to guarantee 'cheap bread' to the industrial worker the peasant must be placed under the dictatorship of the proletariat. The book, it is said, enjoyed great prestige among the Marxists during the 1870's (see Mitrany, op. cit., p. 15). That Eccarius's view has become the basis of Communist agrarian policy is beyond question: 'general collectivization of the peasants is indeed a means of . . . securing the supply of food [for the towns]' (V. Lenin, *Selected Works*, Moscow, 1934–9, vol. xii, p. 13).

according to the very essence of Marxism the Stalinist formula cannot claim to be 'scientific'.[1]

Marx was, however, aware of the conflict between the industrial and agricultural divisions of society. He once remarked quite *en passant* that 'the whole economic history of society is summed up in the movement of this antithesis [the division between the city and the countryside]'.[2] This remark is extremely important. It shows that Marx, for once, recognized the existence of an antithesis which—as we argued in the preceding section—seems rooted in the permanent conditions of the human species, and which should therefore outweigh any antithesis peculiar to a particular economic system. Unfortunately, Marx did not explore this point further to explain how he would have envisaged the *scientific* (in the Hegelian sense) solution of that antithesis.

4. Policy without Theory. In the first half of the nineteenth century, while the West grew intensively preoccupied with the lot of the industrial masses, Russia witnessed the rise of a social movement concerned solely with the peasant. Time and again, essentially different economic conditions imposed entirely different preoccupations. It was not, therefore, because of the much discussed intellectual isolation of Russia that the founders of this new ideology borrowed nothing from Western economic theories. They simply drew the logical consequences from the fact that these theories were moulded on a different economic reality. But as their intellectual inheritance contained nothing regarding the economics of a peasant community, the new social reformers had to start from scratch. They soon discovered that their personal social background could not help them in grasping the problems in which they were interested, and as a consequence decided to go 'to the people'. This slogan earned them the Russian name of *Narodniki*, but outside Russia they became generally known as Populists.[3]

As Marxism began to acquire a basis of its own in Russia, the incompatibility between Marxist theory and the Russian reality gave rise to a fierce and more lasting conflict between *Narodniki* and Marxists than that between the orthodox Marxists and the Agrarian Socialists in the West. Some *Narodniki* did become attracted by Marxism, primarily because its programmatic implications and social dialectics appealed to their revolutionary spirit. But as it was impossible to fit the peculiarities of an agrarian economy into the Marxist frame, most of these succumbed as

[1] As we shall see, neither can it be justified on positive welfare grounds, *infra*, p. 37 n. 2, p. 38 n. 1.

[2] Marx, *Capital*, i, ch. xiv, sec. 4, p. 387.

[3] Alexander Herzen, who in 1847 went into exile because of his political activity, is generally regarded as 'the founder of Russian "Socialism", or "Narodnikism" ', as Lenin put it. Quoted *Correspondence*, p. 285.

hetero-Marxists. The great majority of the *Narodniki*, however, refused to be lured into denying the specific traits of that economy. And thus the Agrarian ideology came to be identified with a double negation: not Capitalism, not Socialism. It is precisely this double negation that has been called into question by Western economists, whether Marxist or not.

Mitrany observes that Marx's view on peasant agriculture combines 'the townsman's contempt for all things rural and the economist's disapproval of small scale production'.[1] But this is true for most Western social scientists. Add to this, especially, their usual disdain for any idea that is not presented through a mathematical model, and you have the explanation for the misunderstanding of the Agrarians by the West.[2] Indeed the *Narodniki*, like the Agrarians of latter days, have not only failed to construct a theory of the peasant economy—as the others have done for capitalism—but they have distinguished themselves by a lack of interest in, almost a spurn for, analytical preoccupations. They relied exclusively on the intuitive approach, on the *verstehen* of the peasant's *Weltanschauung*, much like the German historical school advocated (although there was hardly any direct contact between the two schools). Populism, like Marxism, represented not only an economic doctrine but a faith as well. And this faith 'fed on a strong sentimental undercurrent, on the emotional piety and rustic ties' of its believers.[3] All this laid Populism open to the accusation of romanticism.

The particular circumstances in which *Narodnikism* began its career may account for much of its peculiar spirit. But the lack of any true theorizing in the Populist doctrine was due more to the unusual difficulty of casting the peasant's economic conduct into a schema than to anything else. For this we have the testimony of one of the most praiseworthy Russian Agrarians, Alexander Tschajanov, who gave to one of his works the symptomatic title: *Die Lehre von der bäuerlichen Wirtschaft: Versuch einer Theorie der Familienwirtschaft im Landbau* (Berlin, 1932). In the concluding remarks of this book, in which he submits only the various activities of agricultural production to quantitative analysis, Tschajanov confesses his dissatisfaction over the fact that we still do not possess a

[1] Mitrany, op. cit., p. 6.

[2] In this respect, it is highly instructive to compare, for instance, the analysis of Populism by L. H. Roberts, *Rumania*, New Haven, 1951, pp. 142 ff., with that by Rosa Luxemburg, *The Accumulation of Capital*, London, 1959, pp. 271–91. Although Rosa Luxemburg was 'a more genuine Marxist than any other member of the German movement' (Paul M. Sweezy, *The Theory of Capitalist Development*, New York, 1942, p. 207), her analysis is far more objective than Roberts's.

On the *Narodniki*, one may fruitfully consult also J. Delewski, 'Les Idées des "narodniki" russes', *Revue d'économie politique*, XXXV (1921), pp. 432–62, and above all Mitrany, op. cit., ch. iv. The memoirs of the 'grandmother' of the Russian revolution, Katerina Breshkovskaia, *Hidden Springs of the Russian Revolution*, Stanford, 1931, are interesting as personal history.

[3] Mitrany, op. cit., p. 40.

theory of the economic behaviour of the peasant. He significantly observes that the relation between Classical economics and an economic theory of a peasant community seems to be similar to that between Euclidian and non-Euclidian geometry. Yet he ends with the admission that an abstract theory of agrarian economics cannot easily be constructed.[1]

Whatever the explanation for the outlook of the Agrarians, there is no more dramatic example of the disaster that awaits him who in formulating an economic policy disregards theoretical analysis, than the well-known fate of the Agrarian parties of Eastern Europe.

II. Overpopulation: A Re-examination

1. The Facts Analysed. The Agrarians have at all times sensed that the plague of most underdeveloped agrarian economies is overpopulation and that consequently the problem of a peasant economy is to a large extent a population problem.[2] It is natural, therefore, for us to see whether an analysis of overpopulation would not offer a lead to the solution of the Agrarian riddle.

Whoever speaks of 'excess' is naturally expected to define it in terms of a point of reference which in some way must represent a normal if not an optimum situation. But to define 'normal' or 'optimum' is not easy, especially if one faces a quibbling relativist. Such a relativist may argue, for instance, that the excess capacity of a monopolistic industry is a fiction because all capacity could be used if monopoly were removed and a new system of distribution were introduced. A wholly analogous position is adopted by Marx in arguing that overpopulation exists only relative to 'the average needs of the self-expansion of capital'.[3] Be this as it may, we must recognize that the concept of overpopulation presents unusual difficulties. Normal (or optimum) population implies the concept of normal (or optimum) life. And even if the latter were not such an elusive concept, we would still find it impossible to choose a 'normal' valid for all times and localities. To avoid the trivial conclusion that every population is normal for the time and place in which it lives, it is necessary to adopt some criterion of normality. This criterion may be dynamic or static, depending on the problem at hand.[4]

Ever since statistical data have been used for comparative purposes, it has become obvious that some agricultural countries presented symptoms suggesting the existence of some sort of overpopulation. It has been

[1] Op. cit., p. 130.

[2] Cf. Tschajanov, op. cit., p. 131, for instance.

[3] *Capital*, i, ch. xxv, sec. 3, p. 695.

[4] Marx, for instance, argued that the developed means of communication in the United States at the middle of the last century made that country more densely populated than India. Ibid. i, ch. xiv, sec. 4, p. 387.

remarked that given the following data for two prominently agricultural economies, as for instance

	Denmark	*Yugoslavia*
Inhabitants per km.² of arable land	36·6	157·4
Wheat yield in quintals per ha.	22·9	11·0

even if Yugoslavia could raise her agricultural yield to the Danish level, the average Yugoslav would still have only one-quarter as much food as the average Dane. This observation has supplied the basis for a crude concept of relative overpopulation upon which are based the measures of overpopulation in terms of some crop basket as a standard.[1] As has generally been admitted, the concept of relative overpopulation thus defined is ambiguous and the procedure for its measure debatable.[2] The chief drawback of this approach, however, is that it sidetracked the analysis from the right direction. Indeed, a difference in the *per capita* national product (or a sector of it) may be a *symptom* of the difference between two economic systems, but by no means an *intrinsic co-ordinate* of that difference. Otherwise we should regard the economic system of Belgium as different from that of the United States. But the belief that the difference between an agrarian and a capitalist economy is a matter of degree only, not of essence, is still very frequent.

And yet, the elements for the solution of the problem were not out of reach. In the 1930's, studies originating in several countries with large peasantries revealed the astounding fact that a substantial proportion of the population could disappear without the slightest decrease in the national product.[3] The closeness of the independent estimates of the *superfluous* population for each case shows that we are confronted with a real quantitative phenomenon.[4] If additional proof of this is needed, one may invoke some relevant 'experiments' history carried out *in vivo*. For two years after the beginning of hostilities in 1914, agricultural production in Russia was maintained at the pre-war level, although no less than 40 per cent. of the *able-bodied* male peasants were in the army.[5] The

[1] Cf. W. E. Moore, *Economic Demography of Eastern and Southern Europe*, Geneva, 1945, ch. iii.

[2] Ibid., pp. 55 ff.

[3] References to the earliest studies for Poland and Bulgaria in Doreen Warriner, *Economics of Peasant Farming*, London, 1939, pp. 68 f.

[4] For Rumania, one study (*Enciclopedia Românieĭ*, Bucharest, 1939, vol. iii, p. 60) estimated the percentage of superfluous peasant population at 48, another, at 45 (V. Madgearu, *Evoluția economiei românești după războiul mondial*, Bucharest, 1940, p. 49). The first estimate was derived from national statistical data, but the second was checked by *direct observation* in extensive field-work covering sixty villages chosen at random. Moore, op. cit., pp. 63 f., using national data, arrived at a percentage of 51·4.

[5] Leonard E. Hubbard, *The Economics of Soviet Agriculture*, London, 1939, pp. 59, 65.

same phenomenon occurred in Rumania during World War II. Whenever agricultural production collapsed in Eastern Europe during the World Wars it was solely because of the extreme requisition of draught animals, the difficulty of replacing worn-out implements, and, of course, the disturbances caused by the movement of armies. Even the disappearance of some ten million Ukrainian peasants during the so-called liquidation of kulaks, although accompanied also by a radical disturbance of the entire economy, had only an ephemeral influence on agricultural output.[1]

Now, to say simply that part of the population could disappear without causing any decrease in output is not sufficient for a theoretical characterization of overpopulation. The national product of the United States *could* easily be maintained at the same level even though a large proportion of the population were to disappear. The *differentia specifica* between the two situations is that in the latter the national product could be increased if people simply chose to have less leisure, while in the former, not.[2] This difference reveals that the situation where the marginal productivity of labour equals zero is the starting point in searching for a definition of overpopulation. And that there exist countries where the actual marginal productivity of labour is zero for all practical purposes, has been admitted by nearly all students of peasant economies.[3]

All this clearly conflicts with Professor Schultz's categorical statement that there is 'no evidence of any poor country *anywhere* that would even suggest that a transfer of some small fraction, say 5 per cent., of the existing labour force in agriculture, with other things equal, could be made without reducing its [agricultural] production'.[4] Nothing is farther from my thought than to challenge the fact that the concrete cases cited by him prove that in several Latin American countries the agricultural production did fall off after some labour had been transferred to other activities.[5] But that is not sufficient to justify his well-known position, namely that the overpopulation theory of underdevelopment 'as a

[1] Cf. ibid., p. 117. In a recent paper, 'The Theory of Underemployment in Backward Economies', *Journal of Political Economy*, lxv (1957), p. 103, Harvey Leibenstein alludes to some experiences in the Soviet orbit when industrialization would have caused a shortage of labour in the agricultural sector, but fails to say to precisely which events he refers. My guess is that they exhibited only the familiar kind of *spurious* shortage caused by wholesale dislocations of persons, if they did not reflect either peasant resistance or administrative inefficiency.

[2] Marx, *Capital*, i, ch. xxv, sec. 3, p. 698, asserts that if the population of England would be reduced in the same proportion for all categories, the remaining population 'would be absolutely insufficient' to maintain the same level of output in spite of England's 'colossal' means for saving labour. Clearly, this implies that no skilled labour has *free* leisure, a characteristic assumption of Marxist economics.

[3] E.g. Warriner, op. cit., p. 65.

[4] Theodore W. Schultz, 'The Role of Government in Promoting Economic Growth', in *The State of the Social Sciences*, L. D. White, ed., Chicago, 1956, p. 375. (My italics.)

[5] Ibid., pp. 375 f.

"theory" . . . fails in that the expected consequences are not those that one observes'.[1] The situation of most Latin American countries is not identical with that of the East European or Asiatic countries, although they all have this in common: they are underdeveloped. While overpopulation is always accompanied by underdevelopment, it is neither a necessary nor the only cause of it. The underdevelopment of Latin American countries may have other bases than overpopulation.[2] Overpopulation, therefore, cannot provide the basis for a *general* theory of underdeveloped economies, but only of those economic realities beset by it. This is concrete illustration of the point which one of the preceding sections sought to bring home.

To regard the notion of overpopulation as a myth is undoubtedly a Marxist residual. And precisely because that notion still meets with opposition in some circles, a few further remarks seem in order. If in the 'so-called' overpopulated economies the marginal productivity is zero—a critic may ask—how can we explain the fact that in such economies there is a greater need for skilled labour than in the other countries? Certainly—he may continue—you are not going to say that the marginal productivity of an engineer in India or Egypt is zero. But this way of looking at the problem is to intermingle evolutionary factors with static concepts and to confuse labour with capital. An evolutionary change is bound to bring about shortages of some types of skilled labour (and surpluses of some others) in *any* economy. Thus, Italy certainly feels today a shortage of technicians for her newly discovered oilfields. This, however, represents a quasi-bottleneck, to borrow an expression coined in the Marshallian spirit by Professor Lewis.[3] If no further evolutionary changes occur, the quasi-bottleneck will disappear just as any quasi-rent will do. But once the new equilibrium is reached, will the marginal productivity of a petroleum technician become zero? Not at all. For the equilibrium marginal productivity of such a technician represents not only the marginal productivity of his labour but also that of the capital invested in his training.[4] Obviously, this line of reasoning regards labour as a uniform, plastic quality of all human beings, and is—I believe—somewhat in the tradition of Classical as well as Marxist economics. But I fail to see a better way to analyse the problems raised by *population* in its *purely quantitative*

[1] Theodore W. Schultz, *The Economic Test in Latin America*, New York State School of Industrial and Labor Relations, Bulletin 35, August 1956, p. 15.

[2] Although my knowledge of the factual situation in those countries is very superficial, I would venture to suggest that some are 'underpopulated' relative to the available land resources. Professor Schultz's evidence may even corroborate such a view.

[3] W. Arthur Lewis, 'Economic Development With Unlimited Supply of Labor', *The Manchester School*, xxii (1954), p. 145.

[4] Another part may reflect the 'rent' of his personal talents, but that is a side aspect of the problem.

aspect. Actually this view of labour is even more necessary in the analysis of economic growth than of a stationary state, where population may very well be regarded as a frozen distribution of *qualities*.

Therefore, the statement that the marginal productivity of labour is zero implies that the marginal productivity of skilled labour consists only of the marginal productivity of the capital invested in the production of skill. It is a most rational expectation that an overpopulated economy should feel a greater shortage of skilled labour than a non-overpopulated one. Everything points to the fact that a shortage of skilled labour means a shortage of capital, not necessarily of labour. It is a peculiar feature of overpopulated economies that the skilled labourer is overburdened with work while the unskilled is loafing most of the time. Further still, the real economic aspect of spreading knowledge in an underdeveloped country now appears in full light: the need for additional education competes with the need for additional physical means of production, a fact which we are apt to overlook at times and underestimate often. Where resources are very scarce, free education for all types of skills is as *uneconomic* as haphazard production of capital equipment. Some countries, like Soviet Russia, seem to have grasped this truth; others, such as Italy, apparently have not.

It is a simple matter of definition to observe now that in any economy, whether overpopulated or not, there is only one way to measure the marginal productivity of labour: at the margin, i.e. where labour appears unadulterated by capital. The marginal productivity of labour in any economy then is the marginal productivity of its unskilled labour. It is a mere factual coincidence that in poor countries agricultural labour generally is unskilled labour. But this fact throws a new light upon the constant correlation of overpopulation with the agricultural conditions in the economic literature. For clearly, if the marginal productivity of labour in a country is zero, so must be the marginal productivity of the peasant.

2. A Theoretical Schema.[1] To make the argument as simple as possible, let us assume that the national *product*, represented aggregatively by x, is produced by an atomistic 'industry' (an assumption fully justified in overpopulated agrarian economies). This means that the production function of the entire economy is homogeneous of the first degree

$$x = F(L, T) = TG(L/T) \tag{1}$$

where L stands for labour, and T for a composite variable of land and capital. To obtain this function, for each proportion of the factors of

[1] I prefer the term 'schema' to the commonly used 'model', for I wish thereby to emphasize the essential difference between the *blueprint-model* of natural sciences and the *simile-schema* of social sciences.

production Op (Fig. 1), we determine the optimum size, U, of the production unit, from the system

$$T = pL \qquad L\frac{\partial f}{\partial L} + T\frac{\partial f}{\partial T} = f(T, L) \tag{2}$$

where $f(T, L)$ is the production function of the 'firm'. The maximum product obtainable from a given combination of factors, R, is equal to OR/OU times the output of U. That determines (1) for every R. It is

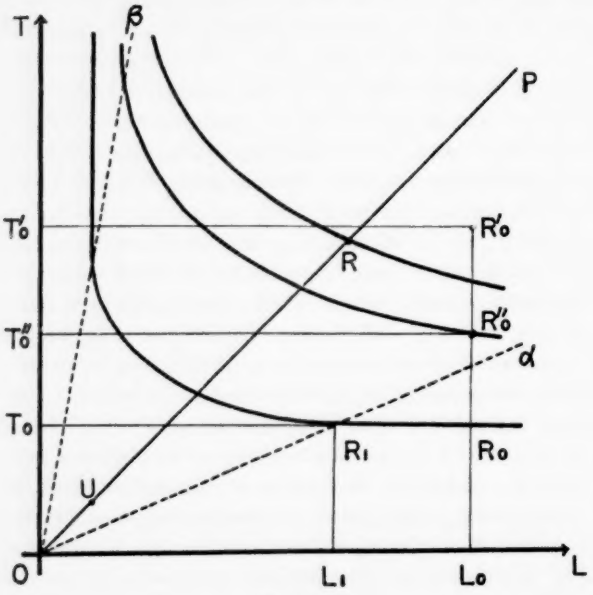


FIG. 1

important, however, to remember that to obtain the output computed from (1), the resources $R(L, T)$ must be equally divided among OR/OU identical production units.[1] It is also seen that given the amounts of the factors of production, the optimum scale of the 'firm' is *uniquely* determined for every technological horizon. Hence, in the case where the geo-historical conditions of an economy are such that *all available resources* must be used in production as long as they increase output, the argument regarding the superiority of the large-scale production is poor economics.[2]

[1] Strictly speaking, OR/OU is not necessarily an integer, but for an atomistic industry this does not matter. We should also point out that U is placed out of scale in Fig. 1; otherwise it could hardly be distinguished from O on the drawing.

[2] That is the fault of the argument advanced by Kautsky *et al.* against peasant holdings. *Supra*, p. 7 n. 3.

There is no need to go over the reasons why the isoquants of any production function sooner or later become parallel to the axes. Thus, in the region $LO\alpha$, for instance, the output can be increased if and only if there is an increase in the factor land-capital. We shall refer to such a factor as limitative.[1] Clearly, in the region where a factor is limitative its marginal productivity is constant, while that of all other factors is zero.

A few definitions. Let the population, P, of a given economy be divided into P_w, the working class, and P_g, the 'government' class. In the latter class we include all members of the economy who are not dependent on wages or salaries received from the 'industry' producing x.[2] Let s and s' be the individual *minimum* standard of living of the working and government class respectively. The position taken in this paper is that both these variables are historically determined, and consequently susceptible of being changed by economic policy. They condition the *minimun* public need for x (public roads, armaments, capital accumulation, &c.). If this minimum is denoted by E, the minimum of the community is

$$\chi = P_w s + P_g s' + E. \tag{3}$$

Let us also put $$F = \phi P_w, \qquad L_0 = \delta F \tag{4}$$

where F is the size of the *potential* labour force, and δ represents the labour-time a worker can supply *above the biologically necessary minimum of sleep and rest*. For symmetry, the time necessary for the latter purpose will not be included in *leisure*.

The primordial economic problem of any community is to find a mode by which a national product equal at least to χ can be obtained with the available resources. One co-ordinate of the problem is the labour supply. Since *ex hypothesi* the working class cannot maintain itself on a smaller real income than sP_w, the supply curve of labour must start discontinuously from an end point M of co-ordinates L_0, sP_w/L_0 (Fig. 2). Since men generally live in families, the labour supply of one individual depends upon the income of his family. To get around the difficulty of circular dependence, we may assume that the labour supply of the community is obtained by summing up the supplies of all families. With this remark, let us consider first the situation in which people can freely sell *leisure* at the market wage-rate, and let MKN represent the amount of labour supplied at various wage-rates. Clearly, MKN is the short-run supply of labour in a

[1] Not to be confused with *limitational*. A factor is limitational when its increase is a necessary but not a sufficient condition for an increase in output. Cf. Nicholas Georgescu-Roegen, 'Limitationality, Limitativeness, and Economic Equilibrium', in *Proceedings of the Second Symposium in Linear Programming*, Washington, D.C., 1955, vol. i, p. 301.

[2] This class corresponds to what Veblen called 'the kept class'. It naturally includes all kinds of servants, public and personal.

wage economy.[1] Its relation with the preference-field is shown more clearly if we refer to a familiar map of indifference curves. In Fig. 3, $OE = \delta$ and $OF = s$. The economic problem of the worker is in fact a discontinuous jump: from E, where his *natural* income places him, at any point in the area $XFF'E'$ (Fig. 3*a*). Where he will finally land depends

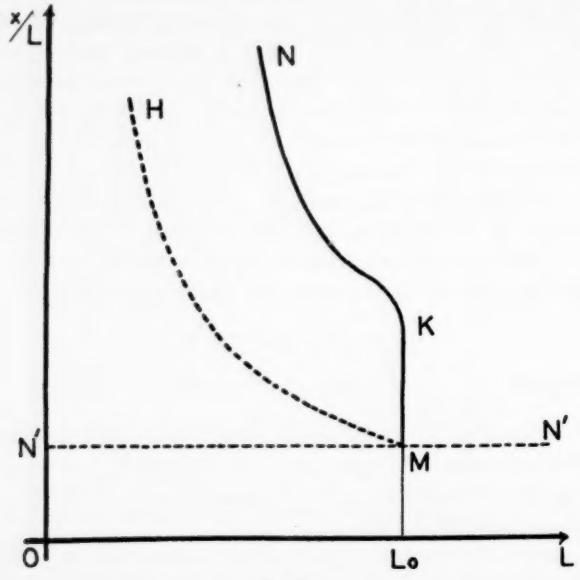


FIG. 2

upon the type of economic system in which he lives. If this is a free wage market, his labour-supply is given by a Hicksian 'price-consumption' curve FF'', and all is well. A very frequent pattern of behaviour is that for which the supply of labour is inelastic for wage-rates just above the minimum possible (i.e. the slope of FE). Be this as it may, we can safely assume that the supply curve of labour has everywhere an elasticity smaller than unity. The literature on underdeveloped countries, however, often mentions a very curious pattern of behaviour; that of the individual who after earning the minimum of subsistence becomes interested exclusively in leisure. Such behaviour, understandably, would

[1] Classical economics argued that the long-run equilibrium wage-rate is constant and equal to ON', so that $N'N'$ represents the long-run supply curve of labour. For Marxist economics, however, $N'N'$ represents both the short- *and* the long-run supply of labour, a direct consequence of its assumption of a permanent reserve army. This is the analytical expression of the distinctive feature of Marxist economics in refusing to accept any relation whatever between economic and demographic factors. On this point, see a letter of Engels in *Correspondence*, p. 199.

make any policy maker despair: the individual seems to refuse to be developed. The behaviour leads to the indifference map shown by Fig. 3*b*, and to a supply curve represented by a branch of an equilateral hyperbola, MH (Fig. ?).[1] Whatever the pattern of behaviour, the curve MH constitutes a relevant element for the analysis of distribution: it represents the minimum average share per unit of labour-time for any amount of employment.

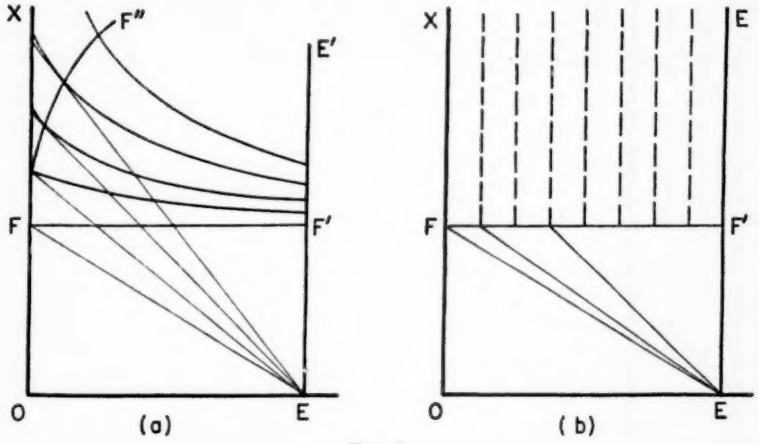


FIG. 3

The second co-ordinate of the economic problem is the productivity of labour under the assumption that all land-capital resources, T_0, are used in the production of x. The curve, μA, representing the average productivity of labour obviously varies with T_0, but its shape presents some constant features (Fig. 4). All these curves begin by a horizontal segment at the same level $O\mu$, because x/L remains constant in the domain $TO\beta$. They also coincide with equilateral hyperbolas below the level $O\mu'$ equal to the value of x/L on $O\alpha$.[2]

If T_0 is sufficiently large, the curve of the marginal productivity of labour μB intersects MN in B (Fig. 4*a*). In such a case the stage is set for the solution of the community's economic problem according to the marginal productivity principle (provided $s'P_g+E$ is not too large, as has been the case in many countries during the World Wars). The economy

[1] I feel that for this type of behaviour we must assume a zero marginal rate of substitution between real income and leisure. But if I am wrong, policy-makers confronted with this hopeless reaction to a wage scheme should be able to get around the difficulty by imposing a *corvée* simultaneously with a very high wage-rate for freely contracted work. A simple diagram will show that in this way they can induce the individual to move inside the area $XFF'E'$.

[2] $TO\beta$ and $O\alpha$ refer to Fig. 1.

may even allocate part of T to the direct use by consumers, so that although the available resources are represented by R'_0, only the amounts represented by R are used in production (Fig. 1). At the other extreme, for low values of T_0, we find the case where the average productivity curve of labour μA lies below $\mu'\mu'$ for $L = L_0$ (Fig. 4*b*). That is the case of ***strict overpopulation.***[1] (This corresponds to R_0 in Fig. 1.) Obviously, in such a

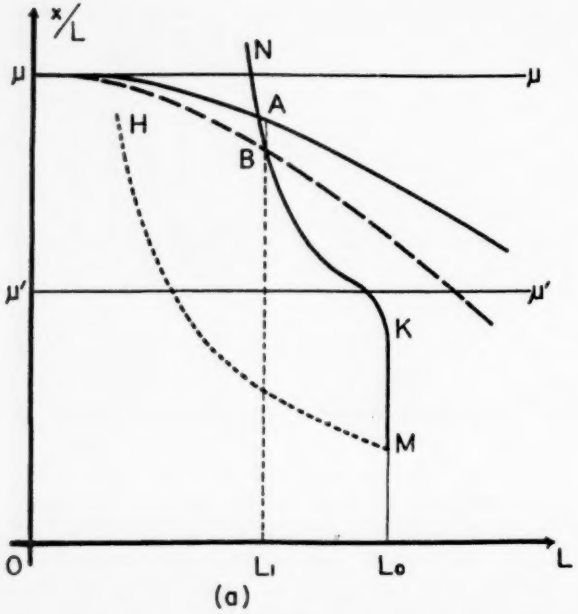
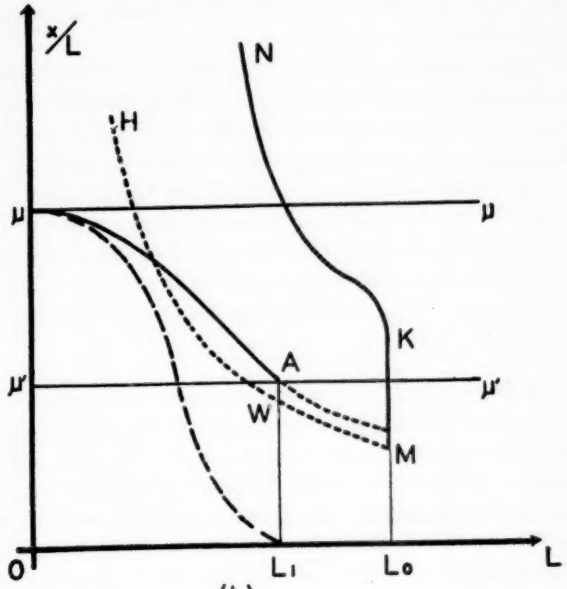


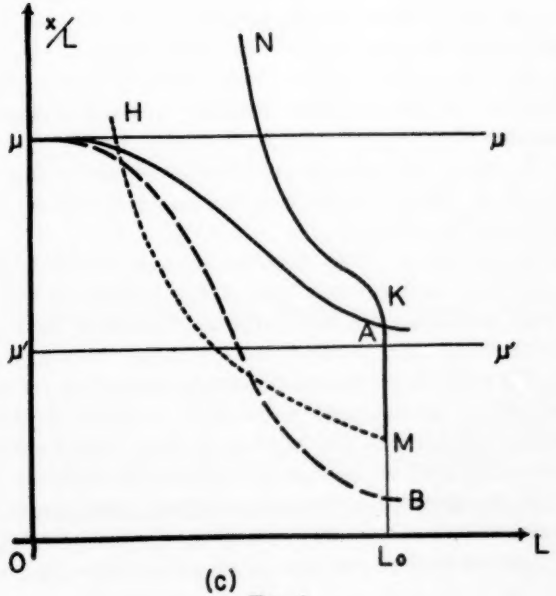
FIG. 4

situation there can be no economic advantage in using labour beyond L_1, where its marginal productivity becomes zero. To continue existing without being beset by Malthusian forces, the economy cannot have a $s'P_g+E$ larger than $AW \times L_1$. In practice, however, this maximum is always attained, so that ordinarily in overpopulated countries $\chi = X_0$, X_0 being the maximum national product obtainable with the available resources. It is obvious, however, that the economy cannot possibly function according to the principles of marginal productivity theory. This is true also for an economy where the marginal productivity of labour is positive for $L = L_0$ without being greater than L_0M (Fig. 4*c*). For this and other

[1] We consider only the alternative where μA intersects MN. The opposite case involves Malthusian aspects which though interesting lie beyond the scope of this paper.



(b)



(c)

FIG. 4

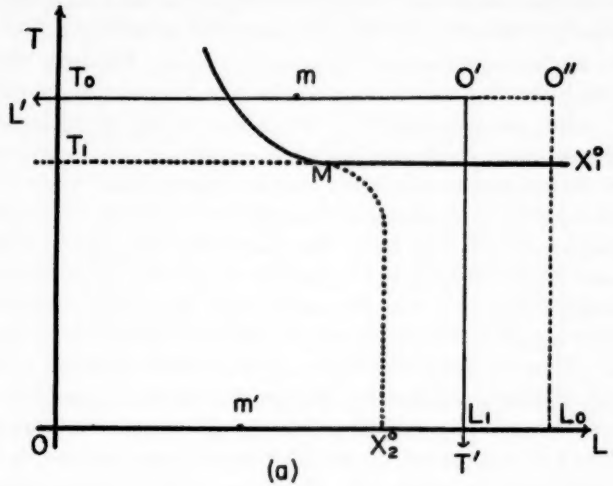
good reasons, such an economy should be regarded as overpopulated, without the qualification 'strictly'.[1]

The important conclusion is that overpopulation is correlated with a low T_0, more precisely with a low T_0/L_0. Overpopulation, therefore, is tantamount to poverty; the opposite situation, to 'land-of-plenty'. In the real world, however, most underdeveloped *agrarian* economies are poor not only because of the insufficiency of land, but also because of a chronic dearth of capital. For these countries the difference between T_0 and the size of usable land, A_0, is negligible. That justifies the use of L_0/A_0 as an ordinal index of agricultural overpopulation instead of L_0/T_0. Finally, by replacing L_0/A_0 by P/A_0, we obtain the most commonly used but crude form of that index.

3. Further Remarks. In approaching issues concerning the economy as a whole the economist has but two choices: to use either a general equilibrium apparatus or an aggregative schema. In the first case, he must resign himself to being rather sterile on practical matters; in the second, he must accept the theoretical calamities of aggregation. For more than one reason, I have chosen the latter procedure. It is, however, possible to illustrate the conditions of overpopulation by a schema in which the national product is not completely aggregated. Let us assume that the economy produces an agricultural product, X_1, and an industrial product, X_2. Bearing in mind that in an overpopulated economy the standard of living barely covers the most elementary needs, and that these needs are highly rigid, we may proceed on the assumption that the two products are not substitutable. If the minimum necessary product is represented by X_1^0, X_2^0, the case of overpopulation is illustrated by Fig. 5*a*. The only solution is M, where the marginal productivity of labour is zero in both productive sectors. Hence, in this case too, no advantage can be derived from using labour beyond L_1.

The schema of Fig. 5 forces upon us a series of highly interesting problems. We shall mention only one. A non-isolated economy has the choice between producing one kind of product at home and obtaining it through foreign trade. The question then is whether the resulting national income (X_1', X_2') could allow an overpopulated economy to move from M to m (or m') where the marginal productivity of labour is positive (Fig. 5*a*). We cannot pursue here this intricate problem, but we may at least remark that no agrarian country seems to have been able to escape the conditions of overpopulation by mere trading. Most probably, overpopulation will remain a local problem calling for local remedies as long as people in general neither wish nor are allowed to leave their own lands.

[1] In Fig. 1 this case corresponds to R_0''.



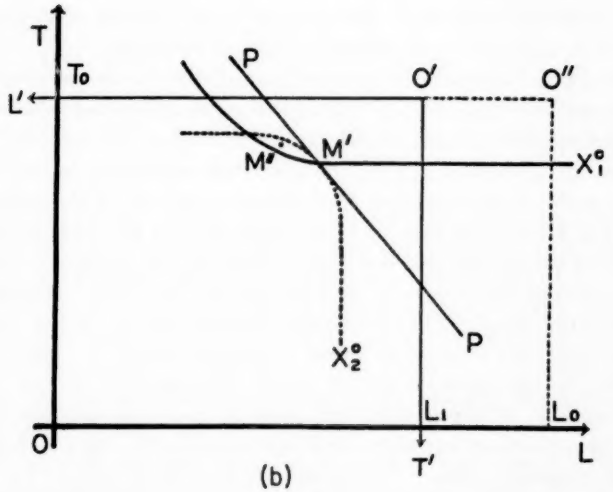


FIG. 5

III. An Analysis of Theoretical Issues

1. Profit versus Tithe. The question of whether the Walrasian system has a mathematical solution has been always considered a crucial one for Standard theory. But no Standard economist seems to have realized that the Walrasian system raises a still more vital question: Is its mathematical

solution also an *economically* valid one? That it is valid has been taken for granted by all who tackled the unusually difficult problem of the existence of the mathematical solution. To recall, Abraham Wald was content with proving that in a (simplified) Walrasian system the 'equilibrium' prices are non-negative.[1] Wald was hardly an economist, but after the publication of the original paper in German (1934), no economist observed that unless we also know that the 'equilibrium' price of labour is at least equal to the minimum of biological subsistence, the theorem has only meagre economic relevance. The truly economic aspect of the problem is most clearly set aside in the more recent work of Arrow and Debreu. These authors start out with the assumption that *every* member of the community is endowed *ab initio* with a sufficient real income for his entire life span.[2] What we do know, however, is that man is endowed with labour of limited efficiency and can use resources of limited quantities. These limits in some cases may be such that although the economy can produce a sufficient real income for all, this *economic* solution cannot be reached by the mechanism of marginal productivity which is part and parcel of the Walrasian system.[3] We have seen that overpopulated economies are in this particular situation. The problem now is to see how production and distribution may be regulated in such an economy.

A lead for the solution of this problem is offered by the observation that agricultural overpopulation has usually been manifest in countries where feudalism was late in being supplanted by capitalism. To see the difference between the distribution under feudalism and capitalism, let us draw the familiar curve of the marginal productivity of labour on the available T_0, $ABCL_1$ in Fig. 6. Let also $abcL_1$ be drawn so that the ratio between the ordinate of the shaded area and that of $ABCL_1$, say between cC and $C'C$, be equal to the tithe ratio, ρ. It is elementary that if OB' labour is used in production, the share of the entrepreneur-landlord is $AabB$ in the feudal system, while the same share under capitalism is $AB''B$. The difference between the two systems is thus clear. But there is also an analogy: to the interest of the government class to maximize profit-rent in the capitalist system, in feudalism there corresponds the interest of the same class to maximize tithe.[4] Obviously, for any given value of ρ, tithe is

[1] Abraham Wald, 'On the System of Equations of Mathematical Economics', *Econometrica*, xix (1951), pp. 368–403.

[2] K. J. Arrow and G. Debreu, 'Existence of Equilibrium for a Competitive Economy', *Econometrica*, xxii (1954), pp. 266, 270.

[3] On the surface, this statement may appear to contradict the theorem proved by Arrow and Debreu. That is not the case. Indeed, their proof assumes the economic problem already solved: the individual has already jumped from E into $XFF'E'$ (Fig. 3a). In their approach, the Walrasian solution may consist of everyone conserving his initial position without any alteration.

[4] Economic relations under feudalism presented almost an infinite gamut. However,

maximum at L_1. In a strictly overpopulated country this maximum is bound to be reached as the result of workers' own necessity of securing

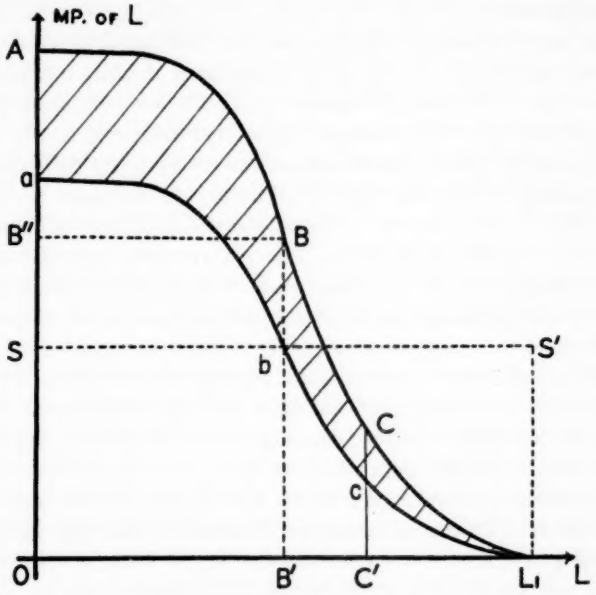


FIG. 6

a share at least equal to sP_w. We should keep in mind also that in the feudal system of distribution *there are workers who earn more than their specific contribution to output*. This is seen immediately if $OSS'L_1$ is drawn so that its area is equivalent to that of $OabcL_1$; all labour between B' and L_1 receives more than its *net* contribution to output. Striking historical evidence of this aspect of feudalism is provided by the gleaners, who received a share greater than the quantity of corn gleaned. In contrast with this, capitalism has no place for gleaners.

It goes without saying that a feudal government class would seek a *maximum maximorum* of tithe by maximizing also ρ. Obviously, the maximum of ρ is given by the ratio AW/AL_1 of Fig. 4*b*, or alternatively by the relation

$$X_0(1-\rho) = sP_w. \tag{5}$$

the most frequent features of feudal economy were the *corvée* and the crop-sharing. The *corvée* usually consisted of work performed at the manor, on the land under special cultures appurtenant to the demesne (vineyards, orchards, gardens), and for public works. Both these institutions survived the legal abolition of the feudal system, as we have had occasion to observe during our own time everywhere in Eastern Europe. The use of the term 'tithe' for the share of the landlord is, admittedly, improper, but convenient.

This means that workers receive only their minimum of subsistence. Yet, this is not a *sine qua non* condition of the system, for at least in a strictly overpopulated economy the workers would still work up to L_1 even if ρ were equal to zero.

The formula *'the labourer must be poor to be industrious'* came to be a key for the feudal system only as the conditions of strict overpopulation ceased to exist owing to land reclamation, to the increase in accumulated capital, and finally to the increase of labour productivity as the result of technical progress. These factors caused the productivity curves of labour to shift upwards and to the right. Ultimately the marginal productivity of labour for $L = L_0$ became positive, but still less than ML_0 (Fig. 4*c*). Clearly, the economy in question was not yet ready for the capitalist formula. Hence, feudalism, which could still provide a solution to the problem of distribution, continued its existence although plagued by a new conflict. If the marginal productivity of labour is positive for $L = L_0$, maximization of tithe requires that workers should have no leisure. Whether they would work to that limit of their own accord in a (not strictly) overpopulated country depends upon the value of $X_0(1-\rho)$, i.e. on ρ. To render the labourers willing to work up to L_0, the average share of labour must not exceed $L_0 K$. This is how the above-mentioned formula came to be an undisputed economic dogma for late feudalism. Even Quesnay argued that the labourer who can buy his bread cheaply becomes 'lazy and arrogant'.[1] How deep-rooted this formula must have been (at least in the late feudalism) is shown by its echoing in economic literature as late as the nineteenth century.[2]

With a ratio T_0/P still too low for the curve of marginal productivity of labour to intersect the supply curve of labour, it was only natural that the feudal formula should have been used also by the non-agricultural sector during the first phase of the industrial revolution, and that it should have survived by inertia well beyond the beginning of capitalism. Only because of this circumstance was it possible for Marx to mistake the basic formula of feudalism for an essential feature of capitalism and thus to formulate a theory of surplus value which is only an elaboration of condition (5).

2. A Discussion of Conduct. Very often, some features of a system

[1] *Oeuvres économiques et philosophiques de F. Quesnay*, Auguste Oncken ed., Paris, 1888, p. 248. The only objection raised by Quesnay is that if abused to the extreme the formula may bring the labourer so close to the status of an animal that he will ultimately behave like one, i.e. respond only to the most elementary needs of the moment and thus lose any interest in his own economic progress (ibid., p. 354). Such a behaviour corresponds to that of Fig. 3*b*. The fact that it has frequently been reported in the poorest countries of long-standing exploitation confirms Quesnay's remarks on the point.

[2] *An Inquiry Into Those Principles Respecting the Nature of Demand*, London, 1821, p. 67, cited by Marx, *Capital*, i, ch. xxiv, sec. 3, p. 653.

become noticeable only under the light cast by a contrasting structure. That—as we have seen—is the case of some aspects of marginal productivity theory when confronted with a feudal mechanism in an overpopulated country. The same is true of the Edgeworth–Pareto pattern of individual behaviour when contrasted with the behaviour of an agrarian (peasant) community.

The founders of modern utility theory all agreed that '*each individual acts as he desires*',[1] a statement that has ever since been repeated in one form or another. But its truth is so tautological that it has no value for a student of human conduct; this student wants to know precisely what pleases the individual. In answering this question, Standard theory assumes that what pleases an individual can be expressed as a function $\psi(Y)$ involving only the quantities of commodities *in his own possession* (represented by the vector Y). That is what I meant earlier by *strictly hedonistic* behaviour.

Undoubtedly, such a description is rigorously true for Robinson Crusoe, but it can hardly fit most individuals living in societies. For even *homo capitalisticus*—which Standard theory is deemed to describe—often varies his tips according to his impression of the attendant's neediness, or patronizes a shop only because its owner is hard-pressed. Whether or not this conduct reflects the faculty of inter-personal comparison of needs, the fact remains that many an individual responds to changes in the income of the others. A more realistic view of the matter, therefore, leads us to regard the ophelimity

$$\Omega = \psi(Y; Y_s) \tag{6}$$

as a function not only of Y but also of Y_s, which stands for the particular criteria by which the individual views the welfare of his community. The individual described by (6) still reacts *hedonistically*—that is, as he desires—but not *strictly hedonistically*.[2]

The problem of individual distribution in a small group—as we know—has no determinate equilibrium in a purely mechanistic schema, whether this refers to an oligopolistic industry or to a small exchange market. In practice a solution is however reached only because the group follows some institutional patterns grown out of its particular historical conditions. And we should not be mistaken about it: price leadership, cartel quotas, product competition, and what not, are just as much cultural patterns

[1] Irving Fisher, *Mathematical Investigations in the Theory of Value and Prices*, New Haven, 1925, p. 11. Also Vilfredo Pareto, *Manuel d'économie politique*, Paris, 1927, p. 62.

[2] Clearly, hedonistic behaviour does not necessarily imply 'altruistic' behaviour; all depends upon the sign of $\partial\psi/\partial Y_s$. The pattern (6) accounts very well for the individual who wants to 'keep up with the Joneses', and who consequently feels a 'pain' if his neighbour's income increases.

as 'ploughing the land of the widow' or marital dowry, for instance. Without institutional patterns concerning distribution, even the first human societies, small by necessity, could not have arrived at that modicum of stability which is the *sine qua non* condition of organic existence. Whether or not the faculty of 'sympathy' for his neighbour is part of man's original nature, that faculty must have evolved before the first viable communities could be formed. Even today, only a type of conduct conforming to (6) can account for the stability of small communities. That, of course, applies first of all to the peasant communities.

A complete description of how individual distribution in a peasant community is regulated must include the institutional patterns prevailing in that particular community. That is why a mechanistic schema of peasant behaviour, like the schema of Standard theory, proved to be an impossible project for all who thought of it.[1] And that is not all. If one finally decides to study the peasant institutions so as to construct a *homo oeconomicus* to represent the peasant, one soon discovers that these institutions are almost infinitely variable, a fact that precludes any relevant classification. It is natural that such a baffling and elusive problem as the conduct of the peasant should have attracted few students and resisted being caught within a simple formula.

The small community not only needs a type of conduct oriented also by Y_s, but it also provides the necessary conditions for the operationality of formula (6). In such a community the individual is bound to realize that his own actions influence his own ophelimity also indirectly, via the co-ordinate Y_s. In addition, everyone naturally arrives at a fairly accurate idea of the situation of everyone else. If these two conditions are not fulfilled, the co-ordinate Y_s cannot be an *active* agent for the conduct of the individual, even if Y_s is an element of the individual's ophelimity. The most relevant example is provided by the urban agglomerations of an industrial society. In such large communities, the individual can no longer know the situation of all his fellows. On the other hand, he is bound to realize that by his isolated actions he can exert only an infinitesimal influence upon the variable Y_s. He is thus naturally compelled to conduct himself as if Y_s did not enter into his ophelimity function. We cannot avoid noticing the great similarity of this situation with that of the individual producer in an atomistic industry, who also is compelled by his particular situation to act as if his own offer had no influence upon the market price. There are thus two reasons that account for the success Standard theory has had with the assumption of a strictly hedonistic *homo oeconomicus*. The *theoretical* success stems from the simplicity of the

[1] Cf. Tschajanov, op. cit., p. 131.

atomistic structure, a reason that finds confirmation also in the completeness of the theory of competitive industry.[1] The *practical* success, on the other hand, is due to the fact that the applications of the theory have always concerned a capitalist economy.

Yet, as J. M. Clark remarked long ago, the demand (i.e. the demand derived from purely hedonistic conduct) cannot reflect any of the social purposes of the community.[2] For the fact that *homo capitalisticus* in general behaves as if his ophelimity were independent of Y_s does not mean that he is basically an egoist in comparison with *homo agricola*—as has often been argued. Yet, a prolonged eclipse of the social variable, Y_s, as a co-ordinate of conduct is apt to cause the disappearance of that variable also from the ophelimity function (i.e. from the individual's awareness). This actually happened at the height of bourgeois liberalism in the West as economic goods in the strict sense became the only co-ordinate of 'rational' conduct. As a Populist wrote in the 1870's, in this conduct there was no room for the principles of justice and solidarity of the village life, but only for success by 'shrewdness and tricks'.[3] That a society could not last long on this basis is proved by the gradual emergence of the welfare state. And to continue our parallel, let us observe that the welfare state is a genuine cartel, the cartel of an atomistic society with the purpose of dealing with a problem for which isolated action is impotent. That is the *raison d'être* of all cartels. However, the cartel of the welfare state is as much an institution as the social patterns of peasant communities.

IV. Concluding Remarks

Because some conclusions of the preceding arguments have a direct bearing on practical issues, it seems appropriate to present them together in this last section.

1. The undifferentiating schema of general equilibrium can only divert our attention from the unique role that leisure plays in economics. For instance, man has always endeavoured to discover labour-saving devices because in the long run leisure is an economic *summum bonum* (and for no other reason). In the short run, on the other hand, leisure may be economically *unwanted*. An advanced economy, such as that represented by Fig. 4*a*, may very well have less leisure than a strictly overpopulated economy, Fig. 4*b*. And indeed, visitors from the lands-of-plenty often point out reprovingly that the people of poor countries indulge in greater

[1] The completeness of monopoly theory also has its counterpoint in the theory of the consumer. As already remarked, in a mono-society such as Crusoe's, ϕ cannot possibly contain Y_s.

[2] J. M. Clark, 'Economic Theory in an Era of Social Readjustment', *American Economic Review*, ix (1919), Suppl., 288 f.

[3] Quoted in Mitrany, op. cit., p. 40.

leisure than themselves. They seem to ignore the fact that in strictly overpopulated countries people have no choice: in those countries leisure is imposed upon them by geo-historical conditions, and is not the result of an opportunity choice between greater leisure and greater real income, as is the case in advanced economies. In a strictly overpopulated economy, leisure is not properly speaking an economic good, for it has no use but as leisure. Its value then can be but zero.[1] The peculiar characteristic of the strictly overpopulated economy, namely that leisure has no value although labour has a positive 'price', bears on the definition of national income.

Walras seems to have been the first economist to include leisure in national income.[2] If x is taken as *numéraire*, and if w and r represent the prices of L and T respectively, Walras's definition of the national income amounts to

$$\phi = x+wl+rt = wL_0+rT_0, \tag{7}$$

where l, t are the amounts of L, T *directly used* by the consumers. The economic relevance of (7) was further revealed by Barone's famous proposition of welfare economics. To recall, this proposition states that for given prices of L and T, optimum welfare requires that the Walrasian national income be maximum.[3] It follows that *if national income is to be used as an index of economic progress*, its only rational definition must be that of (7). But Barone's argument is valid only for an advanced economy, where leisure is time allocated by an opportunity choice and where its price obviously is identical with that of labour. In a strictly overpopulated economy, however, leisure has a zero value. It is natural to think of eliminating it from the national income and hence to define the latter by

$$\phi_1 = x+w(l-l_1)+rt = w(L_0-l_1)+rT_0, \tag{7 *bis*}$$

where l_1 represents the amount of leisure, and $l-l_1$ the amount of personal services. Yet, even the labour corresponding to personal services has no alternative use. Moreover, in overpopulated economies t is usually negligible, for such economies cannot afford hunting grounds, national parks, and the like. The conclusion is that in a strictly overpopulated economy, the most rational index of progress is the national product *stricto sensu*. We should then put

$$\phi_2 = x. \tag{7 *ter*}$$

[1] Further proof of feudal features being attributed to capitalism by Marx is the fact that in his economic theory he assumes that labour power has no use-value *to its owner*. Cf. Kautsky, *The Economic Doctrines*, p. 60.

[2] Léon Walras, *Elements of Pure Economics*, Homewood, Ill., 1954, pp. 215, 379.

[3] Enrico Barone, 'Il ministro della produzione nello stato collettivista', *Giornale degli Economisti*, 1908, pp. 267–93, 391–414. References will be made here to the English translation in *Collectivist Economic Planning*, F. A. von Hayek, ed., London, 1935, pp. 245–90. The above-mentioned proposition is found on pp. 253–7.

In the fact that in an overpopulated economy the feudal formula leads to the maximum national product, we have an equivalent of Barone's proposition: in such an economy the feudal formula warrants maximum welfare.

It is curious that in spite of Barone's proposition the current definition of national income in advanced economies is that of (7 *bis*). Only recently, Simon Kuznets proposed to return to the Walrasian formula on grounds that recall the theoretical implications of Barone's theorem.[1] He rightly points out that by excluding leisure from national income we may obscure an important effect of technological progress. The preceding analysis yields an even stronger conclusion: in comparing the rate of economic development of one advanced and one overpopulated country, we should use in each case the appropriate definition of national income.[2] Indeed, only for the latter economies is it appropriate to define economic progress as the increase per capita net product.

2. Ordinary statistical data may be highly misleading for a measure of leisure in the case of overpopulated countries. As surprising as this may seem, the overpopulated countries furnish the highest occupation ratios (F/P).[3] On the whole, it appears that in those countries it is hard to find someone unemployed, yet almost everyone is loafing. The paradox is easily cleared up. With an excess of labour, everyone fights to establish a solid claim to a share of the national product. This leads to a social pattern which may be labelled 'splitting-the-job'. Several persons are on a job that technically requires only one person, but each one insists on being considered a full-time employee for fear of seeing his claim challenged.

This practice has been frequently denounced as the hallmark of inefficiency if not of remissness. The more scientific critic has justified the verdict on the principle that an efficient economy should pay no factor more than its marginal productivity. It is clear, however, that this argument is an unwarranted extrapolation of a law valid only in advanced economies. Indeed, as we have shown, an overpopulated economy does not operate efficiently unless some labourers earn more than their own contribution to output.

The question of the over-sized bureaucracy—an unfailing characteristic

[1] Simon Kuznets, 'Long-term Changes in the National Income of the United States of America since 1870', in *Income and Wealth, Series II*, Simon Kuznets, ed., Cambridge, 1952, pp. 63 ff.

[2] That is, especially important for the topical comparisons between East European economies and the advanced economies of the West. For I greatly doubt that in any of the Eastern European countries the increase in T_0 has as yet been sufficient in face of population growth to eliminate the conditions of overpopulation.

[3] For example the occupation ratio in Rumania before World War II was one of the highest in the world, *Enciclopedia Românieĭ*, vol. i, p. 154.

of overpopulation—also has been approached from a wrong angle. Few students have realized that in overpopulated countries (and only in these) an over-sized bureaucracy is a normal economic phenomenon. With labour used up to its technical limit, nothing can be gained from a reduction in the number of public or personal servants; such a reduction may create only social turmoil. Many an overpopulated country deserves to be censured not because it has a large bureaucracy but because its entire government class has a high standard of living amidst poverty. Undoubtedly, too high a standard of living for the government class is a deterrent to economic development, for it greatly reduces the already meagre power of capital accumulation of the economy. If in an advanced economy equality of standard of living anwers to an ethical principle, in an overpopulated country it represents an economic imperative.

3. Glossing over academic refinements, we may regard economic development as an upward shifting of the labour productivity curves (Fig. 4). A fabulous amount of foreign aid apart, no economy can *jump* from the situation of Fig. 4*b* to that of Fig. 4*a*. In other words, it is quasi-certain that in its development a strictly overpopulated economy has to pass through a phase like that depicted by Fig. 4*c*, i.e. through a phase where the working class has no leisure at all. This situation with its sixteen-hour day and seven-day week is well known owing to its detailed description by the socialist literature of the last century.[1] As already pointed out, Marx erroneously took it for a basic feature of capitalism. The period in the economic history of the West that served him as a model for depicting 'the calvary of capitalism' corresponds rather to the growing-pains of capitalism. For capitalism, understood as an economic system regulated by profit maximization, could really exist only after the marginal productivity of labour had reached a sufficiently high level so that it could be equated with the wage-rate. Capitalist development proper began only after this phase had been consummated. Increasing leisure (not unwanted leisure) for the working class constitutes its most distinctive feature. To wit, the forty-hour week is a relatively new institution, and the idea of a four-day week is already being aired.[2]

[1] Even in the United States the average working week was seventy hours as late as 1850. Undoubtedly, earlier it was even longer. Interesting also is the fact that the first attempt to limit the work of children under 12 to a ten-hour day was that of the Commonwealth of Massachusetts in 1842. W. S. Woytinsky and Associates, *Employment and Wages in the United States*, New York, 1956, p. 98. The ten-hour day did not become a widespread standard for the other workers until 1860. Philip S. Foner, *History of the Labor Movement in the United States*, New York, 1947, p. 218; G. Gunton, *Wealth and Progress*, New York, 1887, pp. 250 f.

[2] Marx failed to see that one possible synthesis of his antithesis could be precisely this. Instead he wrote that 'the relative overpopulation becomes so much more apparent in a certain country, the more the capitalist mode of production is developed in it'. *Capital*, iii, ch. xiv, sec. 4, p. 277.

Strictly speaking, the East European countries have never come to know the so-called calvary of capitalism. From the middle of the nineteenth century, if not before, these countries began instead to receive the *impact* of Western capitalism. Although usually regarded as a phenomenon equivalent to the 'calvary of capitalism', the impact was an essentially different process. The plain fact is that the East European economies were not yet sufficiently developed to begin the calvary. The true story can be told in a few words. Increasing trade with the West revealed the existence of other economic patterns and at the same time opened up new desires for the landlords and new ambitions for the bureaucracy. Under this influence the feudal *contrat social* began to weaken. An ever-increasing number of landlords switched to the capitalist formula of maximizing profit-rent, a change which, even if it did not always increase their share, had the advantage of freeing them from their traditional obligations towards the villagers. This process was later to culminate in producing the pure absentee. From this viewpoint, the main beneficiary of the freedom of the serfs was the landlord, not the peasant. That is true also of the earliest agrarian reforms (1861 in Russia, 1864 in Rumania), which in reality sanctioned the separation of the economic interests of the landlord from those of the peasant.

Now, to regulate production by profit maximization is probably the worst thing that can happen to an overpopulated economy, for that would increase unwanted leisure while diminishing the national product.[1] To be sure, newly imported techniques alleviated the crisis, but hardly the lot of the peasant. This is the explanation of the fact often commented upon that in Eastern Europe capitalism worsened the lot of the peasant, while in puzzling contrast increasing the prosperity of other sectors. It is this situation peculiar to the countries caught lagging behind Western capitalism that gave rise to the Agrarian ideology. And this ideology remained a regional philosophy at which the West looked as at a curio, precisely because in its economic development the West had not had a similar experience.[2]

4. In a nutshell, the main tenets of the Agrarian doctrine are:

1. Because of their geographical situation some communities will always rely on agriculture as a main economic activity. And since agriculture is an intrinsically different activity from industry, such communities cannot develop along identical lines with the industrial economies.

[1] Kautsky, *Economic Doctrines*, p. 235, recognizes the difficulties created by the adoption of profit-maximization, but fails to see the real explanation of the process.

[2] Only very recently have Western economists come to accept the view of the Agrarians that the East European countries had suffered the impact of foreign patterns not befitting their own cultures and conditions. Cf. *Méthodes et problèmes de l'industrialisation des pays sous-développés*, United Nations, New York, 1955, p. 141.

2. For the countries with an agricultural overpopulation, individual peasant holdings and cottage industry constitute the best economic policy.

Evolution is subject to pure uncertainty, and the most we can do in tackling an evolutionary problem is to trust the existing evidence as a basis for meeting the future. As to this evidence, we have dealt at length with the historical refutation of the law of concentration in agriculture and with the specific differences between industrial and agricultural activities. We may add, however, that nothing as yet has happened to cast any doubt upon the validity of that analysis, and hence upon the first point of the Agrarian doctrine. Besides, the economic development of Denmark and Switzerland as well as parts of Germany and Austria prove that agriculture can provide the basis of its own economic development. Moreover, both anthropology and economic history confirm that only a substantial food production (independent of its source) has led to capital accumulation.[1] Quesnay's celebrated maxim works both ways: *riches paysans, riche royaume*. The logic is surprisingly simple: Robinson Crusoe could not be available for forging a sickle before Friday could gather enough fruits for both. 'Industrialize at all costs' is not the word of economic wisdom, at least in overpopulated agricultural countries.

The second point of the Agrarian doctrine clearly aims at using as much labour in production as is forthcoming. It also reveals that Agrarians were the first to feel intuitively that the economic forms compatible with optimum welfare are not identical for all geo-historical conditions *even if the technological horizon is the same*. We should recall that the real novelty of Barone's work mentioned above was the proof that the controlled economy of a socialist state must imitate the capitalist mechanism, i.e. it must adopt the principles of marginal productivity theory, if it is to obtain optimum welfare. However, neither Barone nor others after him seem to have been aware of one important restriction, namely, that marginal productivity principles presuppose the existence of a well-advanced economy in order to achieve optimum welfare. And thus numerous arguments have felt secure in using the converse proposition: capitalism and controlled socialism provide the best systems for developing an underdeveloped economy. Yet this proposition is patently false, at least for an overpopulated economy.

In this light, the intuition that led the Agrarians to their double negation—not Capitalism, not Socialism—proves to have been surprisingly

[1] V. Gordon Childe, *Social Evolution*, New York, 1951, p. 22; Bruce F. Johnston, 'Agricultural Productivity and Economic Development in Japan', *Journal of Political Economy*, lix (1951), p. 498.

correct. But then, what is the theoretical schema of the Agrarian doctrine? Because Agrarians have hardly bothered with theoretical schemata, one can only attempt an *ex post* rationalization and thereby accept the risks of misinterpreting their own rationale.

5. The arguments presented in this paper unmistakably lead to the conclusion that the Agrarian schema is the feudal formula under a new form. Capitalism—as we have explained—came to Eastern Europe not as a natural phase in economic development, but as the result of cultural contamination. In the light of economic dynamics and positive welfare theory, there can be no doubt that this was a move against the grain. For feudalism was thus displaced before the respective economies had a chance to reach the calvary phase of capitalism, i.e. the *normal* gateway to the advanced stage of economic development. Only a tithe system can efficiently carry an overpopulated economy through that phase.

But from the Marxist viewpoint, the premature disappearance of feudalism was a step in the right direction, for it represented an earlier fulfilment of what must inexorably come (a view probably shared also by most Standard economists). Into the Agrarian ideology we can read, however, a different position, even more Hegelian in spirit: no phase of economic development can be by-passed. In particular: feudalism cannot disappear before it has completely finished its job. If artificially displaced, it will return under one form or another (barring the occurrence of Malthusian holocausts). In such an alternative, the only logical attitude is then to plan rationally for the continuance of feudalism in such a way as to make it work even better. The policy of radical agrarian reforms in overpopulated countries, by which the head of each peasant family is turned into a feudal entrepreneur, responds precisely to this logic.[1]

A very interesting question now comes up: Which of the two Hegelianisms, the Agrarian or the Marxist, is supported by history? The answer must be sought in what happened in the overpopulated countries after a Communist régime took them over. Unfortunately, our knowledge of what happened is very incomplete. Because the marginal productivity formula cannot possibly work efficiently in an overpopulated economy, it is fair to assume that no Communist régime would use it in this situation. If, however, they use a formula equivalent to a tithe system, the Agrarians are fully vindicated. To be sure, in a Communist régime the distribution of income between the government and the working 'groups' may follow an entirely new formula. 'From each according to his abilities, and to

[1] Engels implicitly recognized the merit of feudalism when in a letter of 1892 (*Correspondence*, p. 501) he stated that 'an agrarian revolution in Russia will ruin both the landlord and the small peasant', but he clearly ignored the fact that most landlords had long since ceased to follow the feudal formula.

each according to his needs' has no operational value. Only when we have learned the theoretical schema of this new formula in concrete concepts (labour productivity and labour supply) shall we be able to answer the question in a more complete way.

6. By chance, history supplies us with proof and counter-proof examples regarding the impact of capitalism. The consequences of the premature decay of the feudal formula are best illustrated by the economic situation of the Russian and Rumanian peasant which in relative terms continued to deteriorate all through the hundred years or so preceding World War I. The few timid agrarian reforms were not able to ameliorate the situation, a fact reflected by the frequent peasant jacqueries, some of exceptional intensity. The counter-proof example is provided by Hungary, the well-known bastion of feudalism. In comparison with all her neighbours also plagued by overpopulation, Hungary stood out by virtue of a better fate of the peasant (in most regions) and a conspicuous economic development in all fields. To a great extent this difference can be attributed to the fact that the Hungarian magnate did not succumb to the capitalist formula as his Polish and Rumanian colleagues had done on a large scale.[1] The praises uttered by the apologists of the paternalistic character of Hungarian feudalism were more often than not a *pro domo sua* argument, but they were not entirely without basis. Its undisturbed existence, brought to an end only in 1945 by extra-economic forces, is another proof of the success of that feudalism. But precisely because of this progress, Hungarian feudalism had undoubtedly ceased to represent a necessary economic formula long before 1945.

7. The rather surprising intuition of the Agrarians, however, failed them in one important respect. They were unable to realize that in order to obtain the maximum output from given amounts of resources, the production unit must be of optimum size. Consequently, they could not foresee the danger of determining the size of the peasant holding according to extra-economic criteria. The principle 'a holding for every peasant family' naturally led to a sub-optimum size of the production unit. And this prevented the crystallization of the existing capital in the most efficient form compatible with the prevailing factor ratio and the available techniques. The unmistakable symptom of this situation was a relative excess of capital equipment. In Rumania, for instance, before the radical reform of 1918, there was a plough for every 26 acres; after the reform, there was

[1] The earlier liberation from the economic yoke of a foreign power most probably constitutes another important factor of the difference. But the exploitation of national minorities for which Hungary set a paradigm cannot have been a very important element, for even the lot of these minorities improved in some proportion. We should also remark that, until her dismemberment in 1918, Hungary had almost as high an agricultural density as Poland, Rumania, Yugoslavia, or Bulgaria; this can be seen on the map in Moore, op. cit., p. 73.

one plough for every 15 acres.[1] The Agrarians discovered their error only *post partum*, and when they did, it was much too late. For in East Europe at least, the historical changes of the early 1930's prevented the Agrarian parties from forming a government again.

The facts just mentioned do not justify the prejudice of Stalinist governments in favour of large and highly mechanized farms of the North American type. This prejudice errs in the opposite direction: it leads to a size far greater than the optimum compatible with overpopulation, and hence it uses labour inefficiently.[2]

8. Poor theorists though they have been, Agrarians have never lost sight of the most elementary principle of economic development, which is that no factor should remain *unnecessarily* idle. In overpopulated economies, this may mean using labour even to the point where its marginal productivity becomes zero. From the viewpoint of positive welfare economics, we cannot do better than to cling to this principle. The question, however, is whether we can always comply with it in practice. A small farm, a small shop, can easily be run by a family or a true co-operative, and hence follow the feudal formula. On the other hand, many current products can be produced only by large plants. And large production units requiring numerous employees who have no other ties with each other than working together, lend themselves poorly, if at all, to the feudal formula. Firstly, it is hard to see how a manager could use labour beyond the point where its marginal productivity is equal to the wage-rate and still be able to prove the efficiency of his management. Secondly, once the principle that one can earn more than his own contribution to output has been accepted, the question of everyone doing his duty becomes a thorny problem. In the continuity and closedness of the village, these problems are easily solved by the emergence of cultural patterns in which loafing is one of the worst sins.[3] There, efficiency does not need book-keeping in order to be recognized.

The baffling problem of reconciling the requirements of modern technology with the basic principle of economic welfare is no reason for throwing the latter overboard. In every overpopulated country, at least, there are numerous sectors which either by their nature or by their tradition permit

[1] Cf. N. Georgescu-Roegen, 'Inventarul agricol', *Enciclopedia României*, iii, p. 339. Instances of 'inefficient' forms of capital were quite common. To mention one more: the cows represented less than 70 per cent. of the entire cattle stock. This was a consequence of the fact that every peasant holding needed a pair of oxen for draught purposes, while only a few could keep more than two animals.

[2] Calvin B. Hoover, *The Economic Life of Soviet Russia*, New York, 1932, p. 88, reports of farms having ten times as many workers and twice as much machinery as a farm of equal size in the United States. See also Warriner, op. cit., p. 169.

[3] Some primitive communities—we are told—hold work in such high esteem that they produce more than they need and they destroy the excess. Cf. Richard Thurnwald, *Economics in Primitive Communities*, London, 1932, pp. 209 *passim*.

labour to be used according to the feudal formula. Agriculture is almost everywhere in this category.[1] It would be the worst economics to change the production structure of such a sector because of an ill-advised development fever. No one would dispute the truth that peasant institutions and modern industry do not fit together, but it would be a great error to sacrifice all these institutions on the altar of that truth. And if a scapegoat for failing economic policies is needed, one should find a less expensive one. Many of these institutions will still be needed if the largest output is wanted from the sustaining sectors of economic development. Besides, the iconoclast may live to regret his haste, for we should not be surprised at all if the fight of the Communist régimes against the 'bourgeois spirit'[2] in reality aims at creating a 'socialist man' with a peasant type of conduct.

9. To assume that a process that sustains the progress of advanced economies necessarily befits an overpopulated economy is an unwarranted extrapolation. The ever-growing literature on economic development, however, abounds in such extrapolations. Probably the most patent is the use of marginal productivity principles in formulating economic policies for underdeveloped economies.[3] But few of these economies do not suffer from overpopulation. And it is an obvious feature of overpopulated countries that enterprises operated by feudal formula exist side by side with others managed according to capitalist rules. In such circumstances, price lines are not tangent to the isoquants of every sector and, hence, the isoquants themselves are not tangent to each other. This is easily seen on Fig. 5*b* which represents an economy where X_1 is produced according to the feudal formula and X_2 according to capitalist rules.[4] The price line PP is tangent in M' only to the isoquant of X_2. (And only the workers of X_2 earn *wages*.) Of course, M' does not satisfy the elementary condition

[1] By destroying the peasant holdings altogether and replacing them by book-keeping operated *kolkhozi*, Stalinism certainly made a losing deal with the basic welfare principle. A truly co-operative form of production on units of optimum size with *product ownership* and *tithe* paid in kind to the government would be by far the best welfare solution. Titoism seems to have realized the Stalinist error when it renounced collectivization.

[2] See the resolution of the 1931 All-Russian Congress of Workers in *Report of the Ad Hoc Committee on Forced Labour*, United Nations, I.L.O., Geneva, 1953, pp. 456 f.

[3] Because of the momentous importance of the problem of underdeveloped countries in world affairs, the consequences of these extrapolations may well exceed those of mere academic licences. All the more so, when the source is as high an authority as the United Nations. In *Measures for the Economic Development of Under-Developed Countries*, New York, 1951, p. 49, they urge the use of the principle of marginal productivity which—they complain—'is frequently ignored in practice'.

[4] This schema is not a mere theoretical concoction. It actually corresponds to those economies with a high density of agricultural population living on family holdings and with industry operated more or less on the capitalist formula. Bulgaria, Rumania, and Yugoslavia—to mention only the cases with which I am thoroughly familiar—were precisely in this situation before the advent of Communism. It is precisely because agriculture lends itself easily to operation by the feudal formula that 'too many farmers' is a rather general phenomenon, not peculiar to overpopulated economies.

of positive welfare. The reason, however, is not that the national product would be definitely greater at M'' than at M', but because optimum welfare is represented by M where employment is maximum (Fig. 5*a*). The important fact is that neither M nor M'' can be obtained if industry X_2 works according to the capitalist formula, for in either situation the marginal productivity of labour falls below the minimum of subsistence.

That is not all: the price line may not be tangent to the X_2 isoquant either. For, in contrast with what happened in the West during the early phase of industrialization, the cities of overpopulated countries have grown to pathological sizes through a continuous immigration of rural population. The rural exodus brings into those cities not only an enormous excess of labour but also the germ of the feudal economic spirit to which practically no sector can remain immune. The social pressure of people seeking employment for their worthless leisure is so irresistible at all times that even the most convinced 'marginalist' of the entrepreneurs has to yield to it and hire more people than he should according to his own rule. In these circumstances, prevailing factor prices may be proportionate to anything except the corresponding marginal productivities. To compute the money equivalent of the marginal productivity of an investment on the basis of the prevailing prices is pure nonsense. The criteria of investment priority based on the results of such computation are therefore baseless.[1] Still worse: such criteria point in exactly the wrong direction. Indeed, except for the correction for external economies, these criteria are identical with those used by the private investor. And the result of private investment is a well-known paradox: although labour-intensive techniques are the only ones indicated for overpopulated countries, the industries developed there have generally been capital intensive. The explanation is obvious: in an overpopulated country the ratio between wages and the price of other factors is greater than the ratio between the corresponding marginal productivities.

Economic development does not mean only pure growth; in the first place it means a growth-inducing process. Investment in capital-intensive industries is a wrong move in an overpopulated country not because it fails to bring about growth—for generally it does—but because they are not growth-sustaining. The power to sustain growth then is the only valid criterion of investment in undeveloped countries. The marginal

[1] For the investment criteria based on marginal productivity one may refer to A. E. Kahn, 'Investment Criteria in Development Programs', *Quarterly Journal of Economics*, lxv (1951), pp. 36–61; H. B. Chenery, 'The Application of Investment Criteria', ibid. lxvii (1953), pp. 76–96, among others. Because these criteria are endorsed by some economists serving as consultants to various economic development agencies, one may infer that they are used as a guide for public policy (e.g. G. di Nardi, '"Criteri" e "Indicatori" per la scelta degli investimenti', *Rassegna Economica*, July 1957).

productivity principles reflect this criterion very poorly, if at all. Even for a capitalist system they cannot explain more than distribution through allocation.

The path followed by the West in its economic development can help us in seeking a policy for the development of those areas that have remained behind. But it cannot show us the way. For, clearly, by this policy we do not aim to follow precisely the same route that the West followed. It would take us too long to reach the goal. Still more important: it would not even be feasible, for the opportunities the West has had at one time or another cannot be reproduced. The essential distinction between an historical and a dynamic process does not need to be re-examined here. But, at bottom, this is what Marxists and Agrarians quarrelled about. Can we, as Standard economists, learn something from this quarrel?

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AGGREGATED REBATE SCHEMES AND INDEPENDENT COMPETITION

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AGGREGATED rebate schemes operated by groups of sellers have been examined by the Monopolies Commission both in general terms[1] and also in more detail in the context of a number of particular industries.[2] One of the conclusions reached by the Commission is that 'the principal objection to the use of an aggregated rebate . . . is that it impedes competition from independent producers, because of its strong economic incentive to buyers to confine their purchases to members of the group [operating the scheme]'.[3] It is not the purpose of these notes to challenge this general conclusion. Instead, the purpose is to analyse the special conditions necessary for the achievement through aggregated rebate schemes of an inhibiting effect on independent competition, and the still more special conditions in which the same sort of effect cannot be achieved by alternative group pricing arrangements which do not involve discrimination among buyers according to the amount of their total requirements or purchases from the group.[4] On the first point, the Commission's reports are uninformative; the second point lay outside the scope of the Commission's discussions, but is none the less of some interest for public policy.[5] The present discussion of the economics of aggregated rebate schemes is not meant to be complete; in particular, no attention is given here to the effects of the sellers' discrimination among buyers on competition among the buyers, though in some

[1] Monopolies Commission, *Collective Discrimination*, 1955, chap. 7.

[2] Monopolies Commission: *Report on the Supply of Electric Lamps*, 1951, para. 292; *Report on the Supply of Insulated Electric Wires and Cables*, 1952, para. 313; *Report on the Supply and Export of certain Semi-Manufactures of Copper and Copper-Based Alloys*, 1955, paras. 317–19; *Report on the Supply and Export of Pneumatic Tyres*, 1955, para. 532; *Report on the Supply of Hard Fibre Cordage*, 1956, para. 293; *Report on the Supply of Linoleum*, 1956, paras. 213–15.

[3] *Collective Discrimination*, para. 210.

[4] Because they involve such discrimination, tying devices such as exclusive dealing arrangements, full-line forcing, or two-part tariffs are not considered in this paper; they may well be effective substitutes for an aggregated rebate scheme.

[5] Aggregated rebate schemes are since 1957 subject to registration under the Restrictive Trade Practices Act, 1956, and will be adjudicated by the Restrictive Practices Court. This Court is empowered to make orders, upon the application of the Registrar of Restrictive Trading Agreements, to restrain the parties from continuing an agreement declared to be against the public interest and also 'from making any other agreement . . . *to the like effect*' (my italics). An aggregated rebate scheme operated by a dominant supplier is much the same in its effects as a scheme operated by a group of suppliers; it is likely to be more effective in that there is no need to reconcile different interests. The analysis in this paper applies *mutatis mutandis* to a dominant firm's aggregated rebate scheme. The activities of dominant firms remain subject to investigation by the Monopolies Commission on reference by the Board of Trade.

situations these may well be the most material consequences of an aggregated rebate scheme.

It will be shown that an aggregated rebate scheme can achieve a tying effect on customers—and hence impede independent competition—only in situations where the supplies coming from the two sources, group and independent, differ in a way which is significant to customers. It will be shown, further, that in some situations, but not in others, the asymmetry in supply can be used by the group to obstruct independent competition without the employment of price discrimination among customers on the basis of total purchases (but with the employment of another form of price discrimination).

It is assumed in what follows that a number of otherwise independent suppliers have an agreement to sell their products at agreed minimum prices, subject to the deferred repayment of aggregated rebates to buyers. (This combination will be referred to as an aggregated rebate scheme.) The rebate provisions are of the kind which the Monopolies Commission found to be most usual in practice:[1] the amount of rebate earned by any buyer is calculated from his total purchases from members of the group during a given period, the rebate period. A sliding scale with several rates of rebate is employed, the rate rising step by step with the buyer's total purchases. The rebate, at the highest rate on the scale reached by the buyer, is applied to all his purchases from the group. It is assumed further—and this appears to be the case in practice—that differences in the rates of rebate allowed on different aggregates of purchases exceed any corresponding differential savings in cost to the individual sellers in the group. It is also assumed that there is a competing independent seller (or number of sellers) outside the group, and that members of the group do not have cost advantages in respect of the production and sale of those comparable products supplied both by themselves and by their independent competitor(s).

Two aspects of aggregated rebate schemes call for preliminary consideration; neither is specifically discussed in relation to independent competition in the reports of the Monopolies Commission, though both have some bearing on independent competition.

First, sales by members of the group to buyers earning different rates of rebate yield different rates of profit per unit. Sales to the smaller buyers (smaller in the total of their purchases from the group) are more profitable than those to the larger. This differential profitability may weaken the cohesion of the group, and tempt members into deviations from the agreed

[1] *Collective Discrimination*, para. 192. The report discusses variants, which are not considered in this paper.

prices, particularly when capacity is not fully used. When capacity is strained, on the other hand, sellers may give special preference to the more profitable sales to the smaller buyers unless the agreed prices are raised sufficiently to avoid the rationing of supplies, or larger buyers may have to offer additions to the agreement prices. It is more important for present purposes, however, that, other things being equal, the smaller buyers, who are discriminated against in the aggregated rebate scheme of the group, are likely to be willing customers of independent suppliers as well as being the relatively more profitable customers. To this extent an aggregated rebate scheme has a weakness, as a device for restraining the activities of independent competitors.

The second point concerns the bargaining power of large buyers. It is sometimes said that an aggregated rebate scheme (with larger rebates for larger aggregated purchases) is a necessary concession given under pressure to the large buyers. This explanation was noted by the Monopolies Commission in three reports;[1] the Commission did not, however, pronounce on its validity or explain why the concessions had been considered necessary. Two types of situation may be distinguished. First, without concessions to the large buyers, they might individually use the offer of large and regular orders to cause individual sellers in the group to subvert the structure of agreed prices; the concession of specially favourable rebates is then the sacrifice made to secure the cohesion of the group of sellers. It is not likely, however, that the net prices (i.e. agreed prices less rebates) charged to the big buyers would be lower than those which would obtain in the absence of any effective agreement among the group. Hence, in so far as a particular aggregated rebate scheme merely represents an organized concession to large buyers, the scheme cannot be considered as an obstacle to independent competitors.

The second type of situation is where the large buyers enjoy a strong bargaining position because they are (or are believed to be) in a position to become their own suppliers of the product(s) in question, and thus also possibly to become rival suppliers to other buyers as well. An aggregated rebate scheme can have the effect of forestalling the establishment of new capacity by the backward integration of former buyers; but it can do this only if the net prices charged to these buyers are lower than they would be otherwise. This could come about where, in the absence of any agreement, individual sellers would not take into account the effect of their prices on the long-term possibility that large buyers might be provoked into backward integration, and where, also, a high degree of oligopolistic interdependence between *all* sellers sets a floor to prices above the long-run average costs of production even with the

[1] *Pneumatic Tyres*, para. 532; *Hard Fibre Cordage*, para. 293; *Linoleum*, para. 213.

presence in the market of some large buyers. The aggregated rebate scheme then permits the group of sellers to make a collective sacrifice of short-term profits on their sales to large buyers in order to obtain greater long-term benefits. To the extent that this strategy succeeds, it works to the advantage of independent competitors as well as to that of the group. In short, in both types of situation the recognition of the bargaining power of certain buyers does not react adversely on independent competitors.

Assuming that the sole purpose of the group arrangements is to allow for the varying bargaining strength of different categories of buyer, it should be apparent that generally the only effective substitute for an aggregated rebate scheme would be some other equally and obviously discriminatory system of pricing. But in those situations in which the specific requirements of the larger buyers (as to products or grades) differ significantly in composition from those of the smaller buyers, appropriate adjustment in product or grade price differentials may be a way of bestowing favours in the desired direction (e.g. special prices for special brands). In practice, however, the aggregated rebate scheme has greater flexibility and adaptability in such situations.

We begin now with the analysis of the restraining effect of aggregated rebate schemes on competition by taking a simple case, to which complicating features will be added subsequently. The simple situation is that of the supply of a standardized product (or group of standardized products) produced by all suppliers, group members as well as outsiders, where all sellers have equal access to all buyers at all times. It is assumed, further, that at the beginning of each rebate period all sellers and buyers have full knowledge of prices and rebate rates and conditions, and of the quantities to be bought by each buyer. Each independent seller can vary his prices as between different buyers, and can operate his own aggregated (or other) rebate system, with rates graded, if necessary, according to the total requirements (from all sources) of each buyer.

At the beginning of a rebate period a buyer will decide to be wholly loyal to the group if there is some advantage (or at least no disadvantage) in terms of his total outlay. Such loyalty is certain only where the buyer's total outlay (or average net price) is lower than it would be with alternative purchasing arrangements involving varying degrees of disloyalty, including complete disloyalty. And there is nothing in the assumed situation which precludes an independent supplier from matching the group's terms to any buyer. The complete exclusion of independent competitors from the entire market could be achieved only if the group were to quote net prices lower than those of the independents to all

(size-) categories of buyers. Such price-and-rebate terms would in their effects be similar to a simple price agreement with fixed prices lower than those which the independent sellers are prepared to meet. The material difference is the discrimination in *net* prices among buyers; but since the independent sellers could practise the same kind of discrimination, the issue for public policy concerns the price discrimination *per se*, and not the effect of the scheme on independent competition. As the costs of the members of the group and the independents are assumed to be the same, the group could not undersell independents in respect of all categories of buyer except where it deliberately reduced its net prices to unremunerative levels to drive out the independents. But then it would be the temporary predatory price-cutting and not the rebate scheme as such which has the monopolizing effect.

In principle the situation is not altered when we drop the assumption of perfect knowledge by those in the market. Sellers may not know what the total purchases of a particular buyer will be; and buyers themselves may be uncertain. Again, changes in prices during the rebate period may not be foreseeable. There is no reason, however, why such uncertainty should necessarily bias buyers in favour of greater loyalty to the group; this is so irrespective of the methods of pricing used by the independent seller(s).

The position is materially different when a rebate period is already under way and a buyer has been placing his orders solely (or predominantly) with members of the group. If he now should buy from an independent seller, to that extent he sacrifices the chance of earning a higher rate of rebate on *all* his purchases from the group; and to that extent the incentive to loyalty is strengthened. Expressed differently, the independent supplier has to quote a net price to the partly committed buyer which is lower than the net price quoted by the group.

Suppose the group's basic price for the product is £1 per ton, with a discount rate (applicable to all purchases) of 4 per cent. on purchases up to 1,000 tons, and of 5 per cent. on purchases over 1,000 tons in a rebate period. A particular buyer has already bought 1,000 tons from the group, and needs a further 100 tons for the rest of the period. Should he place the order with a member of the group, he qualifies for the higher rate of rebate. His total outlay increases from £960 (i.e. £1,000—£40) to £1,045 (i.e. £1,100—£55); the 'marginal price' to him of the 100 tons is £85. To induce him to be disloyal, an independent competitor has to quote a price no higher than £85. If this price is unremunerative to him, he is excluded. But is there any reason why it should be unremunerative to him,

considering that the sale of the 100 tons by the member of the group adds only £85 to the total revenue of the members of the group? If the group is able to sell at this 'price', then, on our assumptions, should not the independent supplier also be able to do so without impairing his competitive position? The answer is, in principle, in the negative where the 'marginal' net prices charged by the group are below (avoidable) cost. Provided the average net price (here £95 per 100 tons) is remunerative, the aggregated rebate scheme, stipulating in effect both the price as well as the quantity to be bought, may have a pre-emptive effect in respect of the orders of the favoured and already partly committed buyers, adverse to the interests of independent competitors, without, however, involving the group in losses.[1]

There is nothing in the foregoing, however, to prevent the independent supplier from making similar or equivalent bargains with buyers at the beginning of each period. It is only within a rebate period that initial loyalty can be made to breed further loyalty. But in the situation postulated on p. 44 there is no inherent bias in the operation of this effect as between the group on the one hand, and the independent competitor(s) on the other.

It may be noted, in passing, that the intra-period tying effect of an aggregated rebate scheme cannot be achieved by a straightforward price agreement. It would obviously not do for the group deliberately to quote relatively high prices at the beginning of the period and then to reduce them progressively; neither will the reverse procedure do the job—in both cases the link between price and quantity is absent.

The effect considered in the preceding section is a short-run (intra-period) feature of all aggregated rebate schemes of the class discussed in this paper; but as has been shown, it does not necessarily operate adversely to independent competition either in the short run or in the long

[1] The strength of the intra-period tie depends partly on the details of the scheme itself and partly on the requirements of buyers. (This also applies to the possible longer-term tying effects in the situations which are considered on pp. 47 et seq.) Thus in the particular example used on pp. 45-46, a buyer with requirements of less than 1,000 tons a period is not in any way affected even when he has made his initial purchases from the group; in sales to him the gap between 'marginal price' and 'average price' never opens. Again, for a buyer with requirements in excess of 1,000 tons a period, the gap opens only once, at the 1,000 tons mark; once he has bought more than 1,000 tons from members of the group (having placed his initial orders with the group), there is no further incentive to loyalty. (Uncertainty as to whether he will reach the 1,000 tons level may well stimulate loyalty.) In other words, within the range of any rebate bracket, the scheme operates merely as a flat discount off the relevant purchases. It is not the level of the rebate, but changes in the level of the rebate, which have the special tying effect. The most pervasive tying effect is therefore achieved where the rebate rate rises continuously with the amount of aggregated purchases; in practice this means a scheme with numerous rebate brackets or steps, each covering a small range of purchase aggregates.

run. An aggregated rebate scheme serves as a *long-run* restraint on independent competition only in those situations in which, by virtue of existing limitations on the quantity and range of output of the independent sellers, buyers are obliged to buy part of their total requirements in each rebate period from members of the group. In such cases the buyers in question are already partly committed to the group before the rebate period begins. In effect, so long as the limitations are present, these buyers are always part of the way inside a rebate period; their initial loyalty to the group is compulsory; and a rebate scheme can be used, as before, to give the group an advantage over the independent firms in the competition for the uncommitted business of the buyers. Expressed differently, the group can offer to reduce prices on those purchases which will have to be made from its members, but on condition that other purchases are also made from them. The disability of the independent sellers can be overcome only by an extension of their capacity in quantity or range; the disability may itself render this extension more difficult.

It is apparent, then, that an aggregated rebate scheme can restrain or impede independent competition only when there is, from the point of view of buyers, a significant difference between the position of the group of suppliers and that of the independent suppliers, an asymmetrical situation which enables the former to have some hold over customers. The force of this restraint will differ from one situation to another. It will depend in part on the detailed provisions of the aggregated rebate scheme itself (see p. 46, n. 1). It will also depend on the nature and extent of differences in the requirements of the various buyers in the market for the product(s): what is a significant asymmetry for one particular buyer may not be the same for another. (This will be illustrated below.) Moreover, the duration of the restraint depends ultimately on the ease or difficulty with which the independent competitors are able so to extend their output as to remove the asymmetry.

In what follows no attempt is made to list all conceivable types of asymmetry. Instead, two pairs of situations are considered, the first pair concerning the supply of a standardized product, the second the supply of a range of products including non-standardized products.

Consider again the supply of a standardized product. The independent supplier(s) cannot, it is now assumed, supply the product regularly at all times during the rebate period, and storage costs are particularly high. Sporadic imports of a relatively perishable or bulky low-value product may provide an example. Here the independent supplier cannot supply a regular user's requirements for the whole rebate period, whereas the members of the group can do so. The buyer who requires regular supplies

is therefore partly committed to the group. (A somewhat analogous situation is where the costs of transporting the commodity are relatively high, where the individual's requirements are spread over a large area, and where the supply outlets of the independent supplier(s) are geographically more concentrated than those of the group.)

In principle, the asymmetry which gives rise to the tying effect of an aggregated rebate scheme in the postulated circumstances can also be used in a simple price agreement with similar effect.[1] When the irregular supplier is absent, the group can raise its price; the monopoly profits can be used to 'subsidize' the price when irregular supplies become available, so that these supplies are discouraged.

Consider, once more, the supply of a standardized product. The output of the independent supplier(s) is now assumed to be too small to meet the full periodic requirements of large buyers. Such buyers are necessarily partly committed to the group, and the tying effects of an aggregated rebate scheme follow in respect of these buyers.[2] In this case, however, the asymmetry is such that it cannot be exploited to like effect by a simple pricing agreement without a rebate scheme. Moreover, even special discounts to the large buyers, not linked to quantities bought from the group, would not serve the purpose.[3]

We turn now to a situation where the members of the group supply a wider range of products than the independent competitor(s) and where there are no good substitutes for some of the products supplied by the group. The simplest case for exposition is where all sellers can supply standard lines but where some or all of the members of the group supply patented or otherwise exclusive products as well. Buyers are thus obliged to buy the particular exclusive lines they require from members of the group, whereas they can also patronize the independent suppliers for the standard lines.

The asymmetry is obvious, and an aggregated rebate scheme operated by the group can have an adverse effect on the independent competitors. Differences in the requirements of the two categories of lines by different

[1] The two methods are likely to have different effects on the revenues of the various members of the group. This aspect is considered more fully in another but analogous context; see p. 49 below.

[2] In this case small buyers, whose total requirements could be supplied by the independent supplier(s), would not recognize the asymmetry in the two sources of supply, and would not be tied.

[3] The group could, of course, require such buyers to make lump sum payments for the privilege of buying from the group (the amount of such payments depending upon the amount of a buyer's necessary purchases from the group) and use the proceeds to reduce the firm price (i.e. not subject to rebate) of the product.

buyers again weaken the tying effect, and in the limiting case, a buyer in the market for standard lines alone is not tied at all. But it is also obvious that the tying effect of the rebate scheme derives from the group's monopoly of the exclusive lines, and persists only so long as the monopoly persists. It follows that the group could, in principle, erect obstacles to the advance of independent competitors without a rebate scheme. It could price the exclusive lines to yield the highest monopoly profits, and use the proceeds to set the prices of the standard lines at levels low enough to deter independent competition. It is the element of monopoly, and not the particular practice, which provides the leverage in the postulated situation.

The members of the group will not necessarily be indifferent as between an aggregated rebate scheme and a pricing system as outlined in the preceding paragraph. The total revenue accruing to the group may be affected by the method adopted, applied so as to achieve a given degree of deterrent effect. (It seems impossible to say *a priori* whether an aggregated rebate scheme is more or less 'economical' to its practitioners than an alternative method.) Moreover, even where the total revenue is not affected, its division among the members of the group may well differ. Prima facie, in one respect at least, the aggregated rebate scheme gives greater flexibility in arranging the division of the total profits.[1] This is so because, within limits, the prices of individual lines within the range can be varied without altering the deterrent effect; the buyer is interested in the total outlay on a range of lines, and not in the itemized composition of the outlay. Thus the base prices of standard lines could, for example, be set rather high if the group wished to ensure the adherence of members producing only (or mainly) the standard lines. The limits to this flexibility are set by differences in the composition of the requirements of different buyers.

With the alternative method of straight prices this flexibility is lost, because then the particular prices of individual lines matter to the buyer, and have to be set by the group in the light of the absence or presence of competition. Assistance can be given to the members who concentrate on standard lines only by having, in addition, some sort of profit-sharing arrangement within the group.

The second situation with a range of heterogeneous products is more

[1] There is always an arbitrary element in the distribution of profits among members of a group operating an aggregated rebate scheme, since the individual member's revenues depend upon the categories of buyer to whom he sells—and he cannot be sure in what rebate-category a particular buyer will fall.

complicated (and more far-fetched) than the first (considered on pp. 48–49). A certain product is produced in a variety of designs. New designs are prepared and offered annually to retailer-buyers, each of whom wants a certain number of new designs to sell in his shop. The final demand for the various designs is largely unpredictable. The manufacturers announce the prices of their designs at the beginning of the year. Each manufacturer sets the same price on all his designs, since the costs of production are the same and there is no reason to believe that one particular design will sell better or worse than the others. The members of the group agree on this uniform price and on the rates of rebate. The prices of designs are not altered during the year. A buyer who does not place an introductory order for a particular design at the beginning of the year is not supplied with that design later in the year.

Assume now that there are three suppliers, *A*, *B*, and *C*, each producing six designs a year. A certain retailer requires ten new designs a year. In the circumstances he must buy at least four designs from *A* and *B* to make up a full range. If *A* and *B* organize an aggregated rebate scheme, the necessary asymmetry is present to produce some tying effect on the retailer, and *C*'s competitive disadvantage is apparent. As before, however, the tying effects of the scheme are weakened by differences in the requirements of buyers; for example, *C*'s disadvantage as against *A* and *B* is reduced in respect of buyers who need fewer designs.

The present situation differs from that previously discussed in that the deterrent effect of the rebate scheme cannot be duplicated in a simple price agreement with different prices for different lines. *Ex hypothesi* the sellers have no means of picking the winners, and hence of pricing the successes so as to produce profits with which to subsidize the prices of the less successful. The aggregated rebate scheme, on the other hand, achieves this result. This case is therefore similar to the second case of a standardized product considered on p. 48; the similarity lies in the fact that in both cases it is not possible to identify *ex ante* those particular sales in respect of which the group has a valuable 'monopoly' power.[1]

We return, in conclusion, to the reports of the Monopolies Commission. The discussions of aggregated rebate schemes may be criticized not for the conclusions on the restraining effects of such schemes, though an aggregated rebate scheme need not necessarily have these effects, but for the absence of explanation of the asymmetry (between the positions of the group and the independents *vis-à-vis* buyers) which made it possible for the mechanism to be employed in a particular situation. The reports

[1] Again, the group could take advantage of the width of the range of its products by requiring lump-sum payments from buyers who must have recourse to it.

on particular industries do not contain sufficient data to enable the reader to infer the nature of the operative asymmetry, nor to assess the strength of the restraint which, as has been shown, depends in part on differences in the situations of different buyers.

LONDON SCHOOL OF ECONOMICS
AND POLITICAL SCIENCE

NOTES ON THE WORKING OF THE GOLD STANDARD BEFORE 1914

By A. G. FORD

I

THE pre-1914 gold standard may be seen as a sterling standard largely, with London as its pivot, which had gradually developed in the nineteenth century. Despite the use of a common international currency, some striking features of this standard and its operation were the differences in the economic behaviour of the countries who were members of this 'club'.

Much of the theoretical and practical discussion of the gold standard has centred on the repercussions of gold movements and of the consequential banking measures on international capital movements, incomes, and prices in the countries concerned. Less attention has been paid to the following two questions: (*a*) why did the exchanges move to either of the gold points and gold move? (*b*) what equilibrating forces might be set in motion by the factors causing the gold movement? It will be argued that it is of crucial importance to ask these questions in order to understand the actual operation of the gold standard, for the same factors (e.g. a fall in export values or a fall in receipts from foreign borrowing) causing the export of gold or the loss of foreign balances may automatically set in motion income movements which reduce the initial discrepancy between foreign currency receipts and payments. Two cases will be considered: (*a*) Great Britain, and (*b*) Argentina, an economy which had a chequered history of adherence (and otherwise) to the gold standard before 1914. Contrasts will emerge between the operation of the gold standard for the central country and for a 'periphery' country, both of which were geared together by trade and capital flows. This approach will thus follow up the suggestion of P. Barrett Whale, who, after emphasizing that the suggestions in his well-known article[1] were tentative, stated: 'They provide a hypothetical view of the working of the gold standard . . .; but it is admitted that my view requires a more exhaustive testing, with regard to both the cases in which the gold standard has worked successfully and those in which it has broken down, before it can claim acceptance.'[2]

II

This section will attempt to set up a general model of adjustment for gold standard conditions, although certain portions may well be absent

[1] P. Barrett Whale, 'The Working of the Pre-War Gold Standard', *Economica*, 1937 (reprinted in *Papers in English Monetary History*, ed. T. S. Ashton and R. S. Sayers, Oxford, 1953).

[2] p. 163 of the reprint.

or lack importance when actual conditions of particular economies are considered. The principal answers to the question 'Why did an excess of foreign currency payments over receipts occur in an economy and gold move out?' may be classified as follows:[1]

1. An increase in import purchases due to an increase in incomes generated by domestic forces (not by an increase in exports), or at the expense of savings with given incomes.

2. An increase in import purchases, more being spent from a given income on foreign goods and less on home goods—for example, because of changes in tastes, tariffs, or prices.

3. A fall in the net proceeds of foreign borrowing transferred to the country and being used to finance domestic expenditure.

4. An increase in lending abroad at the expense of domestic purchases of consumption goods or at the expense of home investment.

5. A fall in export values, either because foreign markets were lost, world prices fell, or more exportables were purchased at home.

6. A transfer of bank deposits from one international monetary centre to another. This might well be an unrepeated 'stock' transaction, rather than a change in a continuing flow of payments, and the loss of gold would cease automatically in this case.

If gold is lost because of factors 2, 3, 4, 5, these disturbing factors will set in motion contractionary income movements in the country, which will be equilibrating in the sense that they will reduce the discrepancy between foreign currency receipts and payments by reducing import purchases.[2] (Vice versa for an influx of gold.) These equilibrating income movements, I suggest, deserve more attention when the actual operation of the gold standard is considered—they account for the speedy adjustment of imports noted in certain cases—and will be dubbed 'automatic' forces for the purposes of this paper.

Secondly, if the loss of gold is allowed to affect the domestic supply of money (i.e. no Exchange Equalization Account), then the contraction of the quantity of money will bring rising interest rates[3] and a contraction in bank credit, both of which will tend to reduce incomes and import purchases. This forms a second 'automatic' equilibrating force.

Thirdly, these may very well be 'induced' measures undertaken to

[1] These may be reworked in the case of an import of gold.

[2] If more exportables were consumed at home at the expense of domestic savings, no contractionary income movements would result immediately—the equilibrating forces would be limited to the effects of the loss of gold on money supply, &c., as in the case of 1. If other countries employ the proceeds of extra loans from the country in question to buy extra goods from her (i.e. increased exports) then the loss of gold and the decline in incomes will both be arrested, perhaps after a time-lag.

[3] This rise will be moderated or even eliminated in the cases where activity falls.

check the loss of gold—an increase in 'bank rate' and the measures taken to make it effective. These will also tend to reduce incomes and import purchases. Moreover, in countries where there is a substantial gold coin circulation, falling domestic activity and incomes will reduce the demand for this type of money so that there will be an 'internal reflux' of gold coins to swell the banking system's or the central bank's gold reserves.

In summary, then, the loss of gold is seen to be associated with equilibrating income movements in certain cases, or to bring about such movements, and falling incomes and activity may very well cause prices to fall and further promote adjustment.[1] Furthermore, the fact that domestic interest rates have risen and that the 'exchange risk' is zero, assuming perfect confidence in the stability of the mint par rate of exchange, will provide an additional speedy but temporary means of stopping the loss of gold through an induced influx of short-term international capital which is seeking maximum remuneration. This capital movement will provide a 'cushion', whilst other forces are bringing about a more fundamental readjustment.

All this analysis may be reworked for the cases of net imports of gold and associated expansionary income movements.

In order to decide what parts of this 'general' model are applicable to particular economies it is necessary to examine their financial, commercial, and political structures before 1914. It will be found that this will lay low any hopes of a general explanation such as that proffered by the old 'Rules of the Game' school, except that changes in incomes provide the basic longer-run equilibrating mechanism. Indeed, not all the countries participating in the gold standard followed these rules—many 'limped'—and devices to prevent gold exports varied from country to country. Again, actual adjustment processes varied: a creditor country found adjustment to a loss of gold easier than a debtor, for it was (and is) always easier to refrain from lending abroad or to recall funds from use abroad than to increase foreign borrowings to staunch the drain of gold. Indeed, differences in structure and nature of a country's economy are crucial, when attempting to assess why the gold standard worked so successfully for some countries and failed for others, and may be summarized briefly. (1) A creditor or a debtor country. (2) An industrial or a primary-producing country. In this case it is of vital importance to realize the differences in export price formation—on a cost basis, or determined in the world commodity markets. (3) Whether domestic investment activity or export receipts was the principal determinant of fluctuations in national income. (4) The size of the economy relative to the world markets. (5) The size of the marginal propensity to import, for on this would depend the speed,

[1] Assuming that the demand elasticities are big enough.

or otherwise, of balance of payments adjustments in response to income changes. (6) The financial organization of the country. Where was the banking system based? (7) The political framework and social system. Were any particular economic interests (e.g. exporters or landowners or rentiers) dominant politically? Was there any past history of depreciation? (8) Gold-mining or non-gold-mining countries.

This list does not pretend to be exhaustive, but it does emphasize the need for examining the positions of particular countries before making any wide theoretical generalizations.

III

In this period an efflux of gold from Britain was stopped first by short-term international capital movements, which had been induced by the Bank of England's actions, and secondly by longer-run equilibrating changes in imports, exports, and long-term loans, which occurred as a result of the automatic and induced forces associated above with a loss of gold. The short-term capital movements responded speedily and provided a 'cushion' whilst the latter forces, which needed time to make their effect felt, gradually changed items in the balance of payments so that monetary pressure might be relaxed without the danger of a renewal of the gold loss. This adjustment mechanism will now be considered in more detail.

When confronted with a net export of gold (which it desired to stop) the Bank of England's main object was to lever up the London market rate of discount in order to bring about equilibrating international capital flows to London, and indeed quick action was necessary because of low gold holdings (these were unremunerative and disliked by profit-seeking British bankers) as compared with British international transactions. The main weapon used was an increase in bank rate, together with measures to make it 'effective' by reducing the available pool of short-term credit in London. However, on occasion devices other than bank rate were employed if the Bank of England did not want internal trade to be affected, but only international capital transactions.[1]

A rise in the market rate of discount had a speedy effect on the exchanges by bringing short-term funds into London, partly because of the complete confidence in the stability of the link between sterling and gold and partly because of institutional reasons peculiar to Britain at this period. For Britain was a short-term creditor—to the tune of £150–£200 million in 1909 according to Hartley Withers's estimates—and higher bank rate, when effective, speedily induced the repatriation of British funds employed

[1] See R. S. Sayers, *Bank of England Operations 1890–1914*, London, 1936, for an interesting and revealing discussion.

abroad to the (now) more lucrative home uses.[1] This unique technical position of London provides much of the explanation of the efficacy of bank rate in speedily staunching gold losses before 1914. Secondly, foreign-owned sterling balances were provided with an added inducement to stay, and fresh foreign money was attracted, more especially as the exchange risk was zero with sterling at the gold export point. Furthermore, the demand for foreign currency was curtailed as borrowing in London became more expensive and difficult, whether short-term loans, raised by discounting finance bills, or long-term issues on the Stock Exchange,[2] whilst some foreign bills were diverted to less expensive money markets for discounting. Thus high market rates of discount by affecting international capital movements served to float the exchanges off the gold export point and to staunch the efflux of gold.

It was indeed important that the main world gold market was located in the same country and controlled by the same financial organization that also regulated these international capital funds. Thus London could, by extending or restricting short-term credits, considerably enhance or restrict the ability of non-residents to buy and ship gold abroad. In other words, such operations enabled London to retain more of the new-mined gold passing through and, if these capital movements shifted the exchanges to the gold import point, to attract gold from other monetary centres. However, it was a feature of the gold standard before 1914 that this latter movement of gold was never 'automatic': for when the German and French exchanges were at their gold export points, on occasion no gold moved because foreign central banks dissuaded bankers by one means or another.[3]

[1] Cf. J. A. Schumpeter, *Business Cycles*, vol. ii, New York, 1939, p. 673. This credit . . . 'which was currently turned into cash to be presently reinvested almost anywhere within the gold area, responded to the Bank's slightest move very much more promptly than foreign-owned balances would have done, facilitated great capital transactions, supported foreign business, mitigated domestic stringencies. Because of its presence, tightening the open market—raising open-market rates—not only regulated, but by drawing gold, eased situations'.

[2] For example, in 1913 the monetary stringencies in London led to Argentine railway companies postponing new issues until the more propitious conditions of early 1914.

[3] For example, Clare, *A Money Market Primer*, 3rd edn., London, 1931, p. 75, referring to the Bank of England and its measures to prevent the export of gold: 'If 5 per cent. fails to arrest the export, other measures may have to be resorted to. The Reichsbank, in such a case, would possibly give exporters to understand that they must be prepared to incur the consequences of its displeasure if the withdrawals were persisted in. This the Bank (sc. of England) cannot do; nor can it put a premium on gold—like the Bank of France did before the law of June 1928 made France a free gold country.' Compare also Goschen, *Essays and Addresses on Economic Questions*, London, 1905, pp. 117–19, and Hartley Withers, *Money Changing*, 2nd edn., London, 1916, pp. 6, 38 (especially).

The Bank of England's own evidence before the U.S. National Monetary Commission of 1910 is instructive (p. 27): Q: 'How do you account for the fact that at times a higher bank rate in England fails to attract gold from the continent, when lower rates prevail there?' A.: 'Because there is no gold market on the continent so free as the London Market and the continental markets frequently do not release gold for export until the rate in London has reached a figure which threatens disturbance to their own financial position.'

Ultimately, though, gold did move from Paris and Berlin, perhaps through fear of what might happen if bank rate had to go yet higher.

It should be pointed out that international capital movements of this nature did not form a permanent flow, but were equivalent to 'stock' transactions, being temporary and very likely to be reversed as soon as the interest differential disappeared. This mechanism, however, would eliminate gold losses which had arisen from excessive speculative short-term capital movements (too many 'finance' bills). The longer-run forces which provided a more basic cure for the loss of gold will now be considered and included here will be a discussion of the internal effects of the gold loss and higher interest rates. Much of what follows will be rather tentative in the sense that detailed empirical studies of particular crises would need to be made to come to any definite conclusions. Nevertheless, I believe that the underlying theoretical structure and approach would prove fruitful for such studies and would stand justified.[1]

Why, then, did the sterling exchanges sag to the gold export point? Let us consider the case where export values fell relatively to imports, other items in the balance of payments remaining constant, because of a decline in foreign buying. (It is assumed that there was a positive marginal propensity to save and that there were lags in the income process so that a fall in exports did not bring an equivalent fall in imports immediately and thus eliminate the gold loss.) Besides bringing a gold loss, the fall in exports caused incomes, activity, and import purchases to fall, thereby alleviating the strain on the balance of payments, the more so if falling British demand for primary produce reduced their prices so that import payments fell on this count also. If this decline in British activity induced a fall in domestic investment, then incomes and imports were reduced still more.

Furthermore, the loss of gold reduced the supply of money, the more so if the gold exported had been paid for by cheque on a joint-stock bank and thus a contraction of bank deposits had been set in motion. Secondly, the increase in bank rate brought increases in domestic interest rates conventionally tied to it, as well as the rise in the London market rate of discount. Borrowing, besides being more expensive, became more difficult, so that domestic expenditure was checked and import purchases were reduced—provided that the monetary stringency lasted long enough. Furthermore, a sustained spell of stringency affected the ability to hold stocks of primary produce, so that stock liquidation or the lack of ability to buy brought falling primary product prices, thereby reducing import payments and reinforcing the effects on import prices noted above.

[1] The author's study of Argentine experience between 1880 and 1914 has convinced him of this rather arrogant claim.

In so far as in such a crisis incomes and activity declined the internal reflux of sovereigns from domestic transactions use helped to swell the Bank of England's gold reserves. But without a decline in activity the reflux in response to interest-rate changes alone was slight.[1]

In this case export prices also tended to fall both because of falling activity in Britain and because of the falling prices of raw materials (e.g. raw cotton prices and their influence on textile prices). This would only help adjustment on those occasions when the foreign price elasticity of demand was greater than one. Lastly, if the prices of home goods fell relatively to imported goods there would be some expenditure—switching effects which helped to promote adjustment. However, these price effects, when they occurred, were of minor importance as compared with the automatic income effects. It will be noticed in this outline that we have neglected the repercussions of variations in British activity and import purchases on the rest of the world and the reaction on purchases of British exports. In any detailed case study it would be improper to neglect such reactions, but the intention of this section is to sketch out certain adjustment forces which have not received enough attention in the past.

If gold was lost because of an increase in import purchases, other balance of payments items remaining the same, two cases must be distinguished: (*a*) rising domestic activity and expenditure (because of a domestic investment boom) which brought rising imports; (*b*) a switch in expenditure from home-produced goods to imports, money incomes initially remaining the same.[2] In the first case the only 'automatic' effects were those resulting from the influence of the loss of gold on the quantity of money, whilst the 'induced' monetary effects also helped to promote balance of payments adjustment as noted above. In the second case incomes and activity automatically fell as expenditure was switched away from home goods, thereby reducing import purchases, to which force the monetary effects were added to promote adjustment.

Consider now the case where gold was exported (net) because an increase occurred in the flow of funds which overseas borrowers were seeking to transfer (in the form of sterling bills or gold) to finance domestic expenditure in their countries, and the exchanges sagged to the gold export point.[3]

[1] See Goschen, *Essays and Addresses on Economic Questions*, London, 1905, p. 121, referring to domestic gold circulation, 'You cannot "tap" this immense mass of sovereigns when you most want gold, except so far as there might be a slight flow towards the centre in times of very dear money. Even if the rate of interest were 8 per cent. the bulk of the people would not carry less gold about then than they did before.'

[2] If increased import purchases were made at the expense of savings, then the analysis of case (*a*) is appropriate.

[3] It is the net proceeds of a loan transferred abroad in this form which affect the exchanges, not the total proceeds of a loan, for some portion of this never left Britain, being spent directly on capital goods for export to the borrower.

Now the spending of such funds in the borrowing countries raised their incomes and their purchases of imports, particularly of consumption goods. Since Britain was an important supplier of such goods, this increased activity abroad eventually increased the demand for British exports and provided an offsetting force to adjust the balance of payments after short-term capital movements had provided a temporary cushion.[1] To this general adjustment force may be added the automatic and induced monetary effects of the gold loss. Again, if gold was lost because more funds were transferred abroad from a given volume of overseas borrowing and less spent directly on British capital goods for export, then incomes and import purchases declined in Britain; likewise if more was lent to overseas countries at the expense of domestic spending.

It was very important for her operation of the gold standard pre-1914 that *ex ante* British foreign lending (i.e. overseas issues in London or undistributed profits retained abroad) generated increases in British exports relative to imports (either by increased sales of investment goods or by induced sales of consumption goods as overseas activity rose) and so facilitated its transfer without balance of payments disruption and prolonged gold loss.[2] Such a process would be facilitated if the pressure of overseas demand turned the terms of trade in Britain's favour by pushing up export prices.

Why, however, in these periods of active lending abroad did rising export values not bring roughly similar increases in imports through rising incomes, so that the tendency of exports to rise relatively to imports and so to bring an increased current account surplus would have been eliminated? First, a sustained increase in exports per period will only bring eventually, *ceteris paribus*, an equivalent increase in imports per period if the marginal propensity to save is zero—a condition certainly untrue for Britain at that time. Secondly, although home and foreign investment tended to move together in the short run, nevertheless the longer-run tendency was for increased foreign investment to take place at the expense of home investment. If the series for these are smoothed with 9-year moving averages, it is clear that the long-run waves of foreign investment have their peaks opposite the troughs in the waves of home investment, so that when foreign investment was relatively high, home investment was low, and vice versa. Thus the income-generating influence of increased export sales was offset by the decline in home investment—so far as these underlying trends are concerned. Again, British lenders, besides switching from home to foreign investment, might perhaps have

[1] It is true that rising export sales would increase British imports as activity increased, but this point needs to be discussed with reference to long-term trends. See below.

[2] For a fuller discussion see A. G. Ford, 'The Transfer of British Foreign Lending, 1870–1914', *Economic History Review*, 1958–9, pp. 302–8.

been tempted to decrease the proportion of their incomes spent on consumption goods so that they could employ their increased savings to purchase the now attractive foreign securities being offered.[1] All these factors would militate against the rise in imports which otherwise might have been expected from rising export values.

It is possible thus to explain why these bursts of overseas investment by Britain were managed with so little disruption to the British balance of payments and her adherence to the gold standard. The necessary (increased) current account surplus was created by inducing directly and indirectly increased export sales relative to import values, and thus the danger of increased foreign lending leading to a severe loss of gold averted. However, if British foreign lending had not influenced export values, as in the French case,[2] then less might have been heard about the smooth operation of the gold standard in this period.

In summary, then, apart from the transfer of short-term deposits and the 'domestic investment boom' cases the other factors causing balance of payments disequilibria and the loss of gold brought equilibrating tendencies through income movements either in Britain or in borrowing countries, whilst present in all cases were the automatic and induced monetary effects. The speedy staunching of gold losses from Britain is to be attributed partly to the peculiar institutional position of Britain which made for rapid changes in the movement of short-term funds and partly to the income forces (automatic in many cases) which were set in motion and brought about a more permanent balance of payments adjustment so that bank rate could then be relaxed. The automatic and induced monetary effects of the gold loss, to which earlier writers assigned much importance in explaining balance of payments readjustment in the longer run, are thus seen to be only *part* of the adjustment mechanism. (The above discussion has concentrated on the export of gold, but the arguments may be reworked for the import of gold.)

In conclusion of this section it should be pointed out that not all countries and territories 'took gold' when they had a balance of payments surplus with Britain. Those in which the 'Anglo' banks were of paramount importance increased their sterling holdings or 'London balances'

[1] In the years of high capital export the ratio of net home investment *plus* realized foreign investment to national income is high (e.g. in 1872 15·0 per cent. and 15·2 per cent. in 1913), whilst in years of low capital export it is low (e.g. in 1882 10·4 per cent. and in 1896 9·7 per cent.). With a balanced budget, these figures indicate the behaviour of the ratio of *ex post* net domestic savings to national income, and may provide some guide to *ex ante* savings. The estimates are taken from J. H. Lenfant, *Economica*, 1951, and years of high activity have been chosen for the purposes of this comparison.

[2] See H. D. White, *The French International Accounts 1880–1913*, Harvard, 1933. Again, if the French had not lent abroad, they might well have disrupted the system by amassing most of the world's gold.

in such cases—the embryo of the Sterling Area. Balance of payments adjustment was thus facilitated for Britain when it meant in some cases not the loss of gold, but the transfer of bank deposits in London from domestic to overseas ownership.

IV

Argentina, of vast land area and with various climates and vegetations, and sparsely populated, advanced rapidly as a primary producer in the nineteenth century as transport barriers were removed. The federal constitution, adopted in 1862, resembled the American, but gave much more power to the President, whilst the dominant political group was the conservative landowning (and export-producing) oligarchy, whose rule was maintained until 1910 either by fraud or by force at the 'free' elections. The fact that power was seated here will enable us to understand certain economic actions of the national governments.

Export values expanded sevenfold within the period 1880–1913, and their composition changed sharply, the main exports in 1880 being wool, fleeces, and hides, whilst after 1890 grains (i.e. wheat, maize, linseed) rose in importance. The twentieth century saw the decline of sheep farming and the rapid rise of cattle ranching and export of frozen beef. It is important to note that Argentina was a relatively small *producer* of these products, whose prices were determined in centralized commodity markets, and thus she had little or no control over her export prices. Additionally, Argentina was heavily dependent on export sales for her well-being, since roughly half of her primary produce was exported. Imports, which expanded six times in value, were composed of food, drink, tobacco, manufactures of all kinds, fuel, machinery, and rails, whilst their prices were largely determined by suppliers, since Argentina was a relatively small part of the world market for these products. Moreover, since Argentine production comprised exportable goods mainly and little import-competing industry existed, there was little substitution between home-produced and imported goods.

Foreign investment by European centres—especially London—together with immigration, from Italy and Spain particularly, had brought about this expansion with the railway as the basic factor which had permitted this 'export-biased' development to take place. Other important destinations of foreign funds were governmental borrowings, public utilities, land mortgage bonds, tramways, and land companies. One important consequence of this borrowing must be noted—the foreign debt-service charges incurred had a large element fixed and payable in gold or sterling.

The domestic currency, the paper peso (a gold peso was an oddity), had

a history of depreciation in the nineteenth century, whilst Argentine banking was anarchic, there being no central bank, although in later years after 1900 the Bank of the Nation tended to be dominant through sheer size. The commercial banks were sharply divided into international banks, based on other monetary centres, which specialized in foreign trade and remittance business, and domestic banks, which looked to local business. Argentina, however, hardly belonged to the English monetary area, as much of the banking system was purely local.

In summary, then, Argentina was an economy predominantly dependent on the production of exportables and the level of foreign currency receipts for the determining of her income and well-being. Her export and import prices together with prices of domestically consumed exportables were determined externally, whilst there was low substitutability between imports and home-produced non-exportables, so that the scope for price changes to promote balance of payments adjustment was severely limited.[1] Furthermore, fluctuations in foreign currency receipts provided the principal cause not only of fluctuations in income, but also of balance of payments disequilibria, so that in this setting the question 'Why did gold move?' is to be answered frequently by pointing to changes in export proceeds or in the flow of funds from abroad. Changes in either of these variables brought directly associated income movements and hence equilibrating changes in import purchases.

In 1881 monetary reforms were enacted in Argentina to remedy the previously chaotic condition of the currency; the main provisions were the definition of the new gold peso, the replacement of the existing paper currencies by a new national paper peso (at par with the gold peso) whose issue by approved banks was subject to regulation by the national government, and the convertibility of paper pesos into gold. In 1883 these were put into operation and Argentina had *formally* rejoined the gold standard. Yet the internal banking system, although sizable, was rudimentary, whilst the foreign-based banks were not dominant nor did they hold the major part of the Argentine gold and foreign exchange reserves. This situation may be contrasted with the institutional arrangements prevailing in New Zealand and Australia, for example, where overseas banks did provide considerable internal facilities and where London branches (or head offices) held the countries' foreign exchange reserves in the form of sterling balances. Sanctions on excessive note issue were weak; indeed the country had a tradition of these being ignored or removed by governments in difficulties, as indeed it had a tradition of depreciated paper money, so

[1] Indeed, in the short run the supply of exportables and the supply of exports (for domestic consumption of exportables was inelastic with respect to price and income) were both highly inelastic, whereas the supply of imports may be taken as perfectly elastic.

that popular confidence in the stability of the paper peso-gold peso link was not high.

Furthermore, the dominant political interests, the export producers and landowners, were not adversely affected by a depreciating exchange; rather a depreciating exchange shifted the distribution of a given real income in their favour whilst an appreciating exchange moved it against them. For, with constant world prices, depreciation increased the paper peso prices of exportables *pari passu*, and hence producers' receipts in paper currency for a given output. Wage-rates (both urban and rural), however, were sluggish, showing no comparable increase, and the landowners' mortgage debts were for the most part fixed in terms of paper currency, so that the gap between their receipts and costs widened by more than the depreciation. On the other hand, an appreciating exchange rate with constant world prices cut the paper prices of exportable produce *pari passu*, shifted the income distribution in favour of wage-earners, for wages were 'sticky' in paper currency, and increased the real burden of a given paper peso debt for landowners. Lastly, less moral shame (such as prevailed widely in Britain) was felt at a depreciating exchange. Accordingly, it is not surprising to find in times of balance of payments deficit a bias in favour of a depreciating exchange rate, and in times of persistent surplus a distinct preference for a stable exchange rate rather than an appreciating rate. Indeed, these effects are of the utmost importance in explaining Argentina's lapse from the gold standard in 1885 and her decision to rejoin in 1900.

With this background it would be reasonable to expect that a small disturbance in the balance of payments, which an older member of the gold standard club could have withstood either from its own resources or by means of short-term foreign loans, might have more serious repercussions. Any sustained export of gold would provoke internal speculation, the populace becoming bulls of gold, and thus the note-issuing banks' gold reserves (in any case none too plentiful) would be subjected to a further drain as gold was absorbed into private hoards in the expectation of a breakdown of the system and the emergence of a gold premium.

Indeed, as early as January 1885 a gold premium had appeared despite the attempts of the issuing banks to preserve paper convertibility at par. In their attempts the Banco Nacional and the Bank of the Province of Buenos Aires had lost 77 million pesos worth of gold and foreign exchange, of which the major share, perhaps 50 million pesos, was absorbed *internally*, the rest internationally. The international drain in 1884 had arisen because the proceeds of foreign borrowing declined whilst imports and foreign debt-service charges had increased and exports barely expanded—these items giving rise to a deficit of 14 million pesos, as compared with a

surplus of 7 million in 1883. Doubtless this drain encouraged some domestic speculative hoarding of gold, but this is not the whole story, for as early as June 1884 the Bank of the Province of Buenos Aires suspended specie payments. This would seem early for international forces to have made their impact; rather, one suspects, it was the victim of some autonomous domestic speculation, perhaps even a deliberate run on gold by the special interests who stood to gain by the emergence of a gold premium. Domestic lack of confidence, justified by precedent, was the first cause of Argentina's withdrawal from the gold standard. The second was the lack of any institutional mechanism for coping with a balance of payments deficit by short-term capital movements and in the longer run by credit contraction.[1] This illustrates a previous theme: a creditor (lending) country can always —easily—bring relief to its balance of payments by lending less abroad; a debtor (borrowing) country will find it hard or even impossible to bring relief by borrowing more—the more so if it has a history of currency depreciation and is thus 'suspect' internationally. Yet to some extent similar economic conditions prevailed in other primary producing countries and exchange stability was preserved before 1914. More, indeed, depended on social, political, and moral attitudes to exchange stability, on the structure of society and the political system, and on tradition.

After 1885 exchange-rate stability was forgotten in Argentina until 1898–9, although income movements still provided the main balance of payments adjustment force.[2] The years 1896–9 saw a steady fall in the gold premium as export values rose, both on account of rising production and rising world primary product prices, so that the distribution of incomes moved against the export-producing and landed interests and in favour of those whose incomes were relatively stable in terms of paper currency, the fall in the gold premium being sufficient to outweigh the rising export prices. Accordingly, the former used their considerable political influence to prevent any further appreciation of the paper peso by enacting in 1899 a measure to stabilize the exchange of paper notes for gold at the rate of 44 gold pesos to 100 paper, or 227·27 paper to 100 gold. Furthermore, these interests claimed that stability would encourage trade and stimulate foreign investment in Argentina, which would become 'respectable' again with fixed exchange rates, in addition preventing too drastic a price-cost

[1] It may be doubted whether the loss of external reserves was allowed to affect the domestic credit position in the same way as in Australia or New Zealand, where sterling balances formed both the banking system's cash reserves and the country's foreign exchange reserves. Given fairly stable cash/deposit ratios, any loss in foreign exchange would bring about a deflationary banking policy with speed. In the 1870's also Argentine governments preferred to authorize extra issues of paper and subsequent depreciation to the rigours of credit contraction needed to preserve specie payments in that crisis.

[2] For a full treatment of this episode, see A. G. Ford, 'Flexible Exchange Rates and Argentina, 1885–1900', *Oxford Economic Papers*, 1958.

deflation which would have occurred otherwise, and which might have inhibited the growth of the economy. Nevertheless, their basic reason for rejoining the gold standard was to prevent any further adverse shift in the distribution of income.

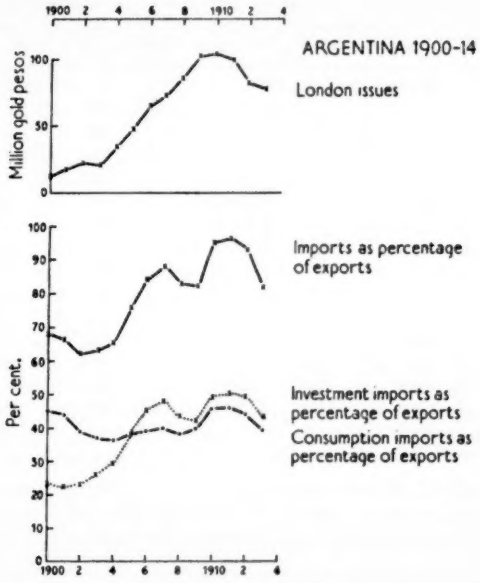

CHART 1. Three-year moving averages

This measure which was put into operation in 1900 provided that the note circulation could only increase if gold were deposited at an exchange bureau, or *Caja*, which in exchange would issue notes at the fixed legal ratio. Conversely, the bureau was legally bound to give out gold in exchange for paper currency. Since Argentina was not a gold producer, international gold movements formed the main determinant of the note issue (see Table I), and secondly of the level of bank deposits and bank credit, as banks' cash reserves varied. The institutional framework thus allowed gold exports, if obtained from the *Caja* or from banking reserves, to contract the quantity of money; gold imports, unless hoarded privately, to expand the money supply (except in so far as the Bank of the Nation tried to offset such forces temporarily). Thus far, then, all was in accordance with the 'rules of the game', but the considerable institutional and structural differences from Britain noted earlier still persisted.

After 1900 Argentina remained a member of the gold standard club until 1914, in these years experiencing considerable growth of production,

TABLE I

Argentina 1900–14

	(1) *Exports*	(2) *Imports*	(3) *London issues for Argentina*	(4) *Gold imports (net)*	(5) *Actual note issue*	(6) *Potential note issue*	(7) (5) *as* % *of* (6)
	million gold pesos				million paper pesos		
1900	155	113	7	6·7	295	310	95
1901	168	114	25	0·1	295	310	95
1902	179	103	16	5·5	296	317	93
1903	221	131	26	24·5	380	379	100
1904	264	187	21	23·3	408	423	96
1905	323	205	61	31·7	498	480	104
1906	292	270	63	16·6	527	506	104
1907	296	286	72	20·4	532	545	98
1908	366	273	80	28·6	581	598	97
1909	397	303	109	65·7	685	740	92
1910	373	352	115	35·4	716	817	88
1911	325	367	84	9·8	723	838	87
1912	480	385	101	35·9	800	920	87
1913	484	421	60	3·6	823	938	88
1914	349	272	76	−13·3	803	966	83

Sources: (1) and (2), *Extracto Estadistico de la Republica Argentina correspondiente al ano, 1915*, Buenos Aires, 1916, p. 3; (3) Author's computations based on *The Economist* 'New Issues' sections; (4) *Extracto Estadistico*, p. 203; (5) and (6) ibid., p. 297.

Notes: £1 = 5 gold pesos.

Import values are somewhat unreliable, as they resulted from the valuation of volumes at Argentine official customs values, which were changed infrequently or suddenly with no close relation to variations in world prices of the goods in some cases. If Argentine imports from U.K. are compared with U.K. exports to Argentina, both series display similar fluctuations and are of comparable absolute magnitude. Export values are more reliable, except that frozen meat exports were valued at constant 'prices' 1900–14, so that official figures are a little too low in total, but by not more than 5 per cent. Despite these difficulties the official figures do give a good indication of what happened.

Potential note issue is the issue which would have resulted if all gold imports (less the quantity of gold absorbed by the Conversion Fund of the Bank of the Nation) had been deposited at the *Caja* in exchange for notes.

population, railway length, exports and imports, within which context her successful gold standard adjustments must be studied. Export values, which expanded at an annual trend rate of 7·5 per cent. (her export prices, it is important to note, rose at 3 per cent. per annum), provided the main force promoting rising incomes and rising profitability of investment projects. After 1904 rising foreign investment and immigration were helpful not merely in bringing income increases as the funds were spent,

TABLE II

Export and Import Price Index Numbers for Argentina 1900–14

	(1) *Total exports*	(2) *Grain exports*	(3) *Pastoral exports*	(4) *Total imports*	(5) *Terms of trade* (1)÷(4)
1900	100	100	100	100	100
1901	99	108	85	87	114
1902	107	114	97	86	123
1903	97	94	102	88	110
1904	103	103	103	88	117
1905	116	114	118	90	129
1906	121	114	132	96	126
1907	125	123	129	100	125
1908	120	133	101	92	131
1909	138	150	119	89	155
1910	142	148	133	87	146
1911	137	143	128	100	137
1912	137	142	130	108	127
1913	139	135	144	108	129
1914	142	136	152	n.a.	n.a.

Source: A. G. Ford, 'Export Price Indices for the Argentine Republic, 1881–1914', *Inter-American Economic Affairs*, Autumn 1955.

but also in expanding the capacity of the economy to produce exportables. These movements are illustrated in Table I where also the uneven response of total imports to these forces may be noted. However, if imports are split into consumption imports and investment imports (following the official subdivision), this may be explained by the resurgence of foreign borrowings. For, on the one hand, rising export proceeds brought rising incomes and hence rising consumption good imports, together with extra imports of investment goods if extra domestic investment was induced; on the other hand, the increased foreign investment funds were partly spent directly abroad on investment goods; whilst the remainder was transferred to Argentina to finance local spending, thus increasing incomes and imports of consumption goods. The influence of this increased foreign investment after 1904 is most noticeable in the behaviour of imports expressed as a percentage of exports as depicted in chart one. This ratio fell until 1903 as debt-service charges and profits remitted were claiming an extra share of export proceeds; thereafter the ratio increased until 1911 under the influence of rising foreign investment, declining after 1911 as foreign borrowings fell. When the ratios of consumption imports and investment imports as a percentage of exports are considered, it is noticeable how sharply the latter was affected by rising foreign investment, whilst the former was mildly affected, for foreign funds transferred to

Argentina then were of relatively minor importance as a generator of incomes as compared with export proceeds.

The expansion of foreign currency receipts, despite the increases in payments on account of growing import purchases and foreign debt-service payments, brought a net influx of gold into the economy in all years except 1914, which was either deposited in the *Caja* (or Conversion Bureau) in exchange for notes or added to the banking system's reserves. International movements of gold thus enabled the note issue to expand at an annual trend rate of 8·8 per cent., whilst bank deposits rose both because of increases in cash reserves and because of declines in the cash/deposit ratios as the economy prospered. On the other hand, in the second half of 1913 and in 1914 when gold was exported on a considerable scale, the note circulation fell and likewise bank deposits, both because of falling cash reserves *and* because of rising cash/deposit ratios. Thus the monetary system served to intensify the influence of rising foreign currency receipts on incomes by increased liquidity and credit, whilst it aggravated the influence of falling foreign currency receipts, since liquidity and credit were curtailed.

The balance of payments adjustment mechanism for Argentina under gold standard conditions may be outlined as follows. Foreign currency receipts, it is asserted, provided the principal cause both of fluctuations in domestic incomes and of changes in Argentina's balance of payments position, whilst foreign currency payments were a dependent variable. Fluctuations in receipts were large enough to swamp any contrary 'autonomous' changes in domestic expenditure—indeed it is to be expected that domestically financed investment would be affected directly by earlier variations in foreign currency receipts.[1] The fluctuations in export prices which were world-determined as noted earlier and must be treated as an independent variable, were quite unconnected with gold movements into or out of Argentina, as the dissimilar behaviour of grain export prices as compared with wool and meat prices clearly indicated (see Table II). Indeed, the scope here for gold movements to influence prices was severely restricted to the prices of home-produced non-exportables, land, and real estate, for import prices were fixed by the foreign sellers. Low elasticities of substitution (*a*) between imports and non-exportables and (*b*) between exportables and non-exportables rendered slight the influences of any relative price changes, which international gold

[1] For example, domestic investment in the meat trade, whether in freezing plants, in ranches, or in stock, was conditioned by the behaviour of the export markets for meat. Domestic building operations also were affected by changes in the balance of payments: on the one hand the prosperity which rising foreign currency receipts brought, induced extra building, whilst the increase in the quantity of money in Argentina, following this expansion of receipts and the net import of gold, provided extra resources for the banking system to lend and lowered interest rates.

movements had brought about via changes in domestic credit policy, on domestic purchases.[1] Nevertheless, these changes would help to promote adjustment, assuming given terms of trade.

Balance of payments adjustment to the main disequilibrating force (variations in foreign currency receipts) was achieved predominantly by corresponding changes in incomes and in imports (more especially consumption goods, since investment good purchases were linked to foreign borrowing) and in invisibles, e.g. dividends and remittances would be higher in years of high activity; of these, imported consumption goods were the principal pliable item. Finally, movements in incomes affected slightly the domestic consumption of exportable products and hence the supply of exports in an equilibrating fashion. Furthermore, this process was aided by the response of the banking system. For changes in imports lagged behind changes in foreign currency receipts so that a rise in export values per month, for example, brought a balance of payments surplus and import of gold, which gradually declined per month as imports rose, disappearing if the marginal propensity to save was zero. Thus income changes were reinforced by the liquidity and credit changes resulting from the gold movements—indeed the note issue and circulation would move in a close direct relationship with the level of incomes.

For completeness, it is necessary to consider the responses of this system to changes in imports unconnected with foreign currency receipt changes. Suppose imports increased on account of a shift in tastes, or a rise in domestic investment, whilst foreign currency receipts remained steady, so that gold was exported and the money supply contracted. In both cases the liquidity check would operate to reduce spending and incomes, whilst in the former case, if more were spent from a given income on imports, less would be available to spend on home goods and thus incomes would be reduced further. Any such change in imports, then—apart from the assertion that it would be of small magnitude in the Argentine setting—contained its own adjustment mechanism to damp its influence down.

It is difficult to verify these mechanisms because of insufficient data (e.g. the lack of *full* estimates of capital influx) and because of the comparative unreliability of some available material (e.g. export and import valuations). Nevertheless, if first differences of annual figures of exports and London issues for Argentina are compared with actual gold movements (both international and internal), it will be found that:

1. International gold movements were associated with these first

[1] It should be noted that rising foreign currency receipts (besides bringing a gold influx) would also increase the domestic demand for non-exportables via rising incomes, and so promote some slight equilibrating changes in purchases if their prices rose. It would indeed be difficult to say whether such prices rose because of such rising incomes, or because of the expansionary effects of the gold influx.

differences of the main constituents of foreign currency receipts—the curves of the net import of gold and the first differences of exports, for example, show broadly similar movements.

2. The supply of gold from private hoards varied closely with export first differences—the net supply being greater when exports rose. (Net supply from private holdings = excess of absorption of *Caja* and banking system over net gold imports for any time period. A negative value indicates an increase in private gold holdings.)

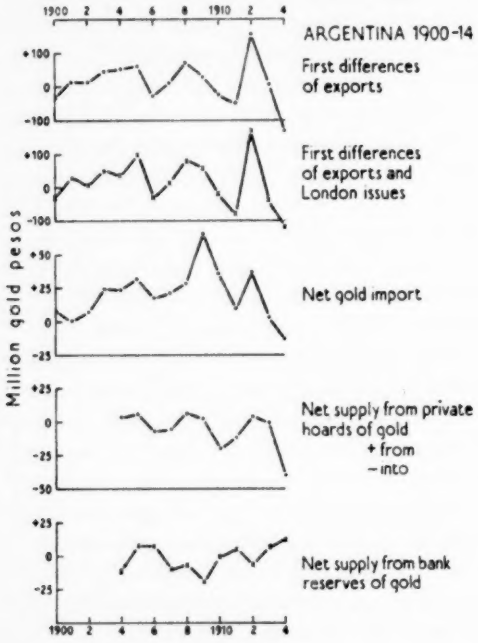
ARGENTINA 1900-14
Million gold pesos
First differences of exports
First differences of exports and London issues
Net gold import
Net supply from private hoards of gold
+ from
− into
Net supply from bank reserves of gold

CHART 2

3. The supply of gold from banking reserves (or alternatively the absorption of gold by banks) was not at all closely associated with export first differences, or in other words changes in banks' visible holdings were very much a residual, balancing the potential supply of gold for note issue and the actual demand for notes.

These movements are illustrated in Chart 2, and in Table III with correlation coefficients.

The potential supply of gold per time period available for changing the note issue thus depended largely on the behaviour of foreign currency receipts and the confidence (or otherwise) which this generated in private

TABLE III

Correlation Coefficients

(*a*) Net gold imports and export first differences (15 observations)	+0·54
(*b*) Net gold imports and export *plus* London issues first differences (15 observations)	+0·61
(*c*) Net gold supply from private holdings and export first differences (11 observations)	+0·85
(*d*) Net gold supply from banking reserves and export first differences (11 observations)	−0·53

Note. The *t*-test indicates that in cases (*a*) and (*b*) correlation coefficients above 0·59 are significant at the 1 per cent. level and above 0·45 at the 5 per cent. level; in cases (*c*) and (*d*) those above 0·68 at the 1 per cent. level and above 0·52 at the 5 per cent. level.

holders of gold so that fluctuations in the *potential* note issue would be closely associated with fluctuations in foreign currency receipts and national income. Furthermore, the predominant demand for notes in Argentina was for transactions purposes, so that the actual issue would also be closely linked to movements in national income. Accordingly, it would be reasonable to expect average note issue per year (average of figures for end-March, June, September, December) to be a reliable indicator of the behaviour of national income. If values for consumption imports and average note issue are compared for 1900–14, a correlation coefficient of +0·95 results, whilst the correlation coefficients for deviations from linear and exponential trends are +0·79 and +0·83 respectively. (With thirteen degrees of freedom the *t*-test indicates that coefficients above +0·76 are significant at the 0·1 per cent. level.) Although these coefficients, it is suspected, would have been higher if Argentine official customs valuations had not varied so much in the years 1904–6, nevertheless the results do demonstrate the close connexion between national income and consumption import purchases.

Argentina had rejoined the gold standard in 1900 largely to stop a shift in income distribution which was unpleasant to the politically dominant landed and export-producing groups, and had employed a system whereby international gold movements affected the note issue. The adjustment mechanism to changes in the balance of payments (reflected in gold movements) consisted of consequent income movements, which were reinforced by the monetary system, and of their effects on import purchases and remittances. In addition, in years when foreign investment was changing, direct purchases of investment goods abroad changed likewise. Short-term international capital movements, which were so responsive to bank rate and market rate of discount changes in the British case, were largely absent.

Why was this system successful in preserving exchange-rate stability until 1914, whilst the system of 1884 collapsed within a year? First, the system never met with the serious test of a sharp efflux of gold as foreign currency receipts declined relatively to payments until the second half of 1913 and afterwards,[1] whilst it was in the interests of the export-producing and landed groups to see that the system worked. After 1902 there were no runs on gold reserves for private speculative reasons until early 1914. Indeed, the *Caja* system, which contemporary commentators dubbed 'fair weather', met 'fair weather' conditions until late 1913. For foreign currency receipts grew steadily as export values and foreign investment rose, and here must be emphasized the importance of rising export prices, which enhanced the value of the growing output of these products, cut the 'produce' value of fixed interest debt, and increased the attractiveness of Argentina to foreign investors. So rapid was the growth of the economy that any temporary setbacks to export values through poor harvests, or to foreign loans, meant a slackening in the rate of growth of incomes, consumption, and imports rather than any sustained downturn.

The difficulties which a primary producing country, heavily dependent on export sales for its prosperity, may experience in maintaining exchange stability, are well known, and in Argentina were aggravated by her international debtor status; a debtor has service charges, which for Argentina had a large core fixed in gold or sterling and formed a considerable item in her foreign currency payments.[2] Further, in times of world depression or adversity there was a tendency for short-term funds to move back to creditor countries and away from debtors, irrespective of the latter's interest rates—a movement which affected Argentina especially keenly because of the lack of international confidence in the peso. Thus no short-term capital movements served to soften the export of gold, which had to be staunched speedily by income movements if exchange stability was to be preserved.

Again, Argentina illustrates the weakness for an 'export' economy where the quantity of money is determined by international gold and foreign currency movements, in that booms and slumps generally arose because of changes in foreign currency receipts which also brought imports or exports of gold as well so that the initial income movements were exaggerated by changes in liquidity. It was thus difficult to accumulate

[1] Because of lags in the transmission of income effects, foreign currency payments, although growing, would tend to lag behind growing foreign currency receipts over a period of years so that each year a favourable balance of payments and net import of gold resulted. Once the growth in foreign currency receipts slackened or ceased, payments would catch up, bringing a less favourable or even adverse balance of payments. Indeed any decrease in receipts would bring a sharp adverse movement in the balance of payments until payments reversed their previous trend and declined.

[2] In the period 1911–14 service charges amounted to some 35 per cent. of export values.

a sufficient gold reserve during a boom to cope with bad times—apart from the itching palm of some early Argentine governments for idle gold! Furthermore, the fact that in years of depression the initial contractive effects were intensified by monetary factors tended to alienate support for the gold standard system. This is quite different from the cases of some other countries where booms and slumps originated for domestic reasons and met with a fairly stable monetary supply so that rising or falling interest rates tended to mitigate these initial income movements. Here booms were associated with adverse balances of payments, slumps with favourable balances so that the monetary policy dictated by gold movements tended to lessen (not enhance) income fluctuations and the gold standard system was more acceptable than in the former case.

These economic difficulties which might have sufficed in themselves to render adherence to the gold standard impossible, were supplemented by political and social factors which in the last resort proved decisive. The domestic convertibility of notes for gold, which was the prime object for Britain and certain other economies and from which the international gold standard sprang, was not such a point of honour and morality. Other primary producers, such as Australia and New Zealand, maintained exchange-rate stability, which is explained by different administrative and political systems with different social structures, and by their banking systems' being based on London. However, in Argentina, aided by the particular economic and political structure, the landed and export-producing oligarchy willingly abandoned or adopted the gold standard system whenever it was to their benefit and profit.

V

Much of the discussion above has been concerned with short-run conditions and adjustment of each economy, and frequently each has been considered in isolation. In this section certain long-run features and interconnexions between these economies will be noted briefly. Although the successful working of this sterling system—for that was really what the pre-1914 gold standard amounted to—did depend on the supreme international confidence in the pound, the particular institutional structure of international banking and finance which was centred in London, the acknowledged dominance of the Bank of England, nevertheless particular economic relationships played an important role in ensuring that, for Britain at least, maladjustments in the flows of international payments and receipts were never too large or too persistent to swamp the institutional structure.

When the stability of this sterling system as a whole is considered, it is important, first, to note that Britain provided a steadily growing market

for the increasing supplies of primary products from the developing countries. Despite considerable fluctuations in British foreign investment and exports, the broad trend of activity showed steady growth, for (as noted earlier) in periods when the former variables were high so far as underlying trend values are concerned, domestic British investment was low, and vice versa, so that one offset somewhat variations in the other. Nevertheless, an element of instability for the primary producers especially remained because they had little influence over the world prices of their produce and hence the terms of trade of primary products for manufactures. Indeed, a sharp fall in their export prices seriously affected their well-being and could strain their adherence to stable exchange rates, especially if their foreign debt-service charges had a large element of fixed-interest payments. However, in general, the growing, assured, market afforded to these producers by Britain enabled them to earn sufficiently increased supplies of sterling to meet their debt-service charges and to increase their imports and well-being.[1]

Important, secondly, was the interlinking of the lending and borrowing countries and the responsiveness of trade flows to capital movements—especially for Britain. For British foreign investment (e.g. by means of new overseas issues on the London Stock Exchange) at times increased considerably and was transferred (in real terms eventually) without any serious strain on the balance of payments because of the influence of *ex ante* overseas investment directly and indirectly on export sales, whilst any temporary strain, as the net proceeds from borrowing were transferred out of Britain in the form of gold or sterling bills, was speedily eased by the reflux of British funds employed abroad. Furthermore, when British investment abroad declined, exports likewise declined, reducing the British current account surplus, so that sterling did not become scarcer. Here the long-run tendency for the peaks in home investment to occur with troughs in foreign investment so that domestic activity was more stable in its growth than exports, was of especial importance in bringing about a rising demand for imports, and helping the primary producers whose production of exportables was expanding as investment projects financed from the last wave of foreign investment from Britain matured.

The following crude pattern of economic relationships between Britain and the primary producers who were on the periphery of the gold standard system suggests itself. British loans to overseas countries increased their

[1] This is a long-run view, which applies once the investment projects (financed from abroad) have matured and expanded the production of exportables. In the short run for primary producers balance of payments difficulties, which strained adherence to the gold standard, did occur because frequently the debt-service charges were immediate (e.g. fixed-interest securities) and bore heavily on an unexpanded output and supply of foreign exchange. Such difficulties did not arise for Britain.

purchases from Britain and their debt-service payments so that on the one hand they did not permanently gain much gold, nor did Britain lose much gold through the loan-transfer transactions. Secondly, when the investment projects matured, their production of exportables was expanded, for which there was a ready market in Britain. The primary producers' exports rose so that they could pay their foreign debt-service charges and dividend remittances, *and* purchase more imports, whilst because of their growing prosperity British exports expanded. Such trade flows thus contributed to the economic growth of both partners and their mutual welfare, besides providing a basis for stability.

This idyllic scheme, although perhaps realized pretty well in the long run, did give rise to particular short-run difficulties—especially for the primary producers. For, in the upsurge of foreign lending if the sums transferred were temporarily in excess of Britain's current account surplus and caused the loss of gold, bank rate adjustments and the reflux of British short-term funds brought speedy relief. On the other hand, the decline in foreign lending often occurred before the investment projects had been completed and had expanded exportable production so that balance of payments difficulties faced the borrowers because of the added burden of extra debt-service charges on an as yet unexpanded production—especially if the ratio of debt-service charges/exports had risen sharply.[1] In this setting of crisis (and possible British fears about these countries' exchange stability or possible default on interest payments) it is dubious whether the short-term pool of credit in London helped such economies to the extent that has sometimes been suggested. Rather they were left to adjust themselves through income movements, which affected their import purchases, whether they remained on the gold standard or perforce embraced a system of flexible exchange rates.

Again, variations in the prices of primary products and in the terms of trade tended to affect these economies more sharply than Britain, for they were more heavily dependent on international trade in most cases.[2] Indeed, in the short run sharp fluctuations impeded or enhanced development, and brought in the former case balance of payments strain. For example, falling primary product prices between 1889 and 1896 prevented Argentine export values from rising, despite a great expansion in the volume of exportable production which foreign investment had facilitated;

[1] Fixed-interest securities, rather than equities, were a feature of British foreign lending, so that service charges were immediate. So long as lending continued, these could be met without much strain, but when lending declined, crises often arose. See A. G. Ford, 'Argentina and the Baring Crisis of 1890', *Oxford Economic Papers*, 1956.

[2] Furthermore, even if primary product prices did move against Britain, she did benefit somewhat, for debtors could pay their service charges and dividend remittances were greater, whilst purchases of British exports rose.

after 1896, however, rising prices enhanced export values, facilitated greatly her return to the gold standard in 1900 and her subsequent adherence until 1914.

In conclusion, mention must be made of one important role played by gold discoveries—they served to keep the whole gold standard system liquid enough to support a growing volume of international transactions and to provide the necessary underpinning of sterling.

UNIVERSITY OF LEICESTER

EARNINGS-DRIFT IN THE UNITED KINGDOM, 1948–57[1]

By JUDITH MARQUAND

I. Introduction

In recent years a growing amount of attention has been paid to the relationship between wage rates and wage earnings. Wage rates can be taken as statutory rates and rates which are negotiated by collective bargaining, while wage earnings are what workers actually receive. The two can differ and usually do. The differences are caused by various factors such as overtime payments and higher payments than the negotiated rate in particular plants or to particular groups of workers, for whatever reasons these may arise. It is the difference between the change in wage earnings and the change in wage rates that is earnings-drift. A distinction can be drawn between earnings-drift and wage-drift, which is usually taken to be the difference between the change in wage earnings once the effect of overtime working has been eliminated, and the change in negotiated wage rates. This distinction is not always drawn, either explicitly or implicitly. It is worth making because for most purposes, such as consideration of the role of wages in inflation, it is the total wage bill, hence earnings, and hence earnings-drift which is relevant. Wage-drift is interesting mainly as the component of earnings-drift which requires the most investigation and explanation. There has been some terminological confusion here, since the term 'wage-drift' has been used indiscriminately for both kinds of drift, and both have been used usually as indicators of excess demand for labour.

To find out how far earnings- or wage-drift can be used in this way, it is necessary to see how these arise and to examine their roles under inflationary conditions. When wages and prices are rising, either wage rates and earnings rise equally fast, or earnings rise at a different speed, usually faster than wage rates. In this case there is earnings-drift and it is earnings-drift, not wage-drift, which is relevant here, since we are concerned with the total wage bill. Wage rates themselves may well be rising, pushed or pulled by the factors usually associated with a 'cost-inflation', but it is not necessarily the same factors which cause earnings-drift. To evaluate the importance of earnings-drift it is necessary to examine what are its components as well as the mechanism by which it arises. Very little detailed statistical work has been done upon either wage-drift or earnings-drift

[1] There are many people to whom I am grateful for assistance. Particularly I am indebted to Professor John T. Dunlop for his detailed criticism of an earlier draft of this paper and to Dr. R. R. Farquharson and Mr. C. E. Phelps for their work in programming and performing the correlation analysis.

in the United Kingdom, with the exception of two brief articles[1] by G. Penrice in *The Times Review of Industry* for September 1952 and for December 1955, and an article[2] dealing with the period 1954–7 by L. A. Dicks-Mireaux in the same journal for September 1958. The neglect of wage- and earnings-drift has arisen from necessity rather than from choice; until the publication in May 1958 by Professor E. Devons and R. C. Ogley[3] of wage-rate indices for most orders of the Standard Industrial Classification for the period 1948–56, no detailed analysis for the United Kingdom could be undertaken.

A major analysis of wage-drift in Sweden has, however, been carried out by B. Hansen and G. Rehn.[4] They define wage-drift as 'the difference between the actual increase of hourly earnings and such increases of earnings stipulated in the annual negotiations over the collective wage agreements (by increases of wage-rates—time and piece-rates—or in other forms)'.[5] Hansen and Rehn go on to test the hypotheses 'that the scarcity of labour, the profit situation of the employers, and the increase of productivity under piecework, respectively, are responsible for the wage-drift'.[6] The conclusions that the authors draw from their analysis are

> that the wage-drift seems to be conditioned by the wage-systems applied and highly influenced by the state of demand and supply in the labour markets. The development of excess profit in the enterprises seems to play a minor role, and our statistical material gives no support to the hypothesis that wage-drift is an automatic consequence of increase of productivity in piecework, except in some branches of industry where the wage system is most strongly tied to production results. Our results predominantly support the hypothesis that the state of the labour market is the most important causal factor behind the wage-drift.[7]

It is possible to apply all of this analysis to the British data, but it is more important to decide how much will be fruitful. Much of the British background is broadly similar to the Swedish and so a similar approach might seem to be in order. Until the last year or so of the period 1948–57 there was considerable pressure on resources in the United Kingdom, apart from the slight suggestion of a recession in 1949 and the recession, mainly in textiles, in 1952–3. By 1955 there was an increase over the whole period in wage rates of 43 per cent.,[8] in earnings of 60 per cent.,[9] in retail prices of

[1] 'Earnings and Wage Rates since 1938', London and Cambridge Economic Service Bulletin, Sept. 1952. 'Earnings and Wage Rates, 1948–55', London and Cambridge Economic Service Bulletin, Dec. 1955.

[2] 'Wage Earnings and Wage Rates, 1954–7', London and Cambridge Economic Service Bulletin, Sept. 1958.

[3] 'An Index of Wage-Rates by Industries', Manchester School of Economic and Social Studies, May 1958.

[4] *On Wage-Drift. A Problem of Money-Wage Dynamics.* Bent Hansen and Gösta Rehn in *Twenty Five Economic Essays in Honour of Erik Lindahl*, 1956.

[5] Hansen and Rehn, op. cit., p. 89.

[6] Op. cit., p. 91. [7] Op. cit., p. 91.

[8] Ministry of Labour wage-rate index, annual averages, 1948 = 100.

[9] Ministry of Labour earnings inquiries, averages of April and October figures, 1948 = 100.

38 per cent.,[1] and in production of 37 per cent.,[2] with the sharpest increases in all these indices occurring at the time of the Korean war and in the last year or so of the period. Sweden too had virtually full employment from 1948 to 1955, yet the Swedish overall wage-drift by 1955 was only 3·93 per cent.,[3] compared with the British earnings-drift of 17 per cent.,[4] made up of about 10 per cent. attributable to increased overtime and a wage-drift of about 7 per cent. It might be thought that differences in the institutional framework would help to account for this, yet for example collective bargaining is much more centralized in Sweden than in Britain, so that a higher wage-drift might have been expected, *ceteris paribus*, in Sweden.[5] It appears that not only this factor but also some of the others which influence wage-drift must differ radically in their effects in the two countries, and that the Swedish analysis cannot be applied uncritically to the British data.

II. Hypotheses

Although not completely separable, three main components of earnings-drift can be distinguished: overtime payments; payments above the negotiated wage rate arising from changes in the technical production conditions; and other extra payments. Also the institutional framework within which wage bargains are struck will be highly relevant to the extent to which the various pressures on the labour market are expressed in the form of wage drift, so that variations in structure are important when inter-industry or international comparisons are made.

Of these components, overtime payments present fewest conceptual and practical problems. They would seem to be related at any one time to the demand for the product of the firm or industry. If the supply of labour is relatively inelastic, or if the employer considers that the high level of demand for his product which necessitates overtime working is of a temporary nature, then changes in overtime payments will reflect changes in demand for the product and will be an important component of earnings-drift. That overtime working is a regular feature of employment in most industries in the United Kingdom makes no difference to the relationship between overtime working and earnings-drift; *changes* in the amount of overtime worked can still occur and it is these which affect the level of earnings-drift.

[1] Interim index of retail prices, annual averages, 1948 = 100.
[2] Index of industrial production, annual averages, 1948 = 100.
[3] Hansen and Rehn, op. cit., p. 90 and table, p. 115.
[4] Calculated as the difference between earnings and wage rates, to correspond more nearly with the Swedish figure, rather than as a ratio. 1955 is chosen for the comparison rather than 1957 since the former is the last year covered by Hansen and Rehn's data.
[5] See below, p. 83.

If the earnings-drift in some industrial orders should prove to be made up almost entirely of increases in overtime payments, then in these orders no further explanation of earnings-drift would be necessary. It will always be possible, by considering changes in the amount of overtime actually worked, to make an approximate estimation of the contribution of changes in overtime payments to earnings-drift. The knowledge that a fairly close relationship exists between overtime and earnings-drift in all the orders, not merely in those where the earnings-drift is composed solely of overtime, should provide a useful guide in a partial correlation analysis to the appropriateness of the other variables; the partial correlation coefficient of overtime and earnings-drift with the effect of other variables eliminated should be positive and significant. Any considerable deviation from this can be taken to reflect adversely upon the extent to which the other variables have been satisfactorily selected or represented rather than to imply that the amount of overtime worked does not have an influence on the size of the earnings-drift.

In this period hours worked provide a satisfactory indicator of overtime since there was virtually no change in standard hours or in the proportion of those in any one industry working to any given standard hours.

The effects of changes in production conditions—changes in the level of output and in the techniques by which it is produced—are less straightforward. Professor Dunlop[1] discusses the effect of increases in output, which increase average earnings 'as a consequence of longer runs of one style, model or product, less informal restriction of output among individuals or groups of workers, and as a consequence of better utilization of overhead labour:' but 'the shape of this relationship (between output and changes in earnings) will show a greater rate of advance in the middle ranges of output than at near capacity levels'. It is difficult to see how this effect can be distinguished from that of other changes in productivity. Increases in output which occur in conjunction with the conditions just described will lead not only to increases in average earnings (presumably through piecework or bonus payments) but also to increases in output per man-hour. There are other reasons, particularly the introduction of new techniques, why output per man-hour should increase. For lack of information about the extent and nature of new techniques introduced, it is impossible to separate the effects on productivity, taken as output per man-hour, of changes in the level of output and of changes in the techniques used. Accordingly there is only confusion to be gained by attempting to analyse separately the effects of changes in the level of output and of changes in productivity upon earnings-drift. Changes in productivity alone must be

[1] J. T. Dunlop, *Wages Policy and General Economic Policy*, lecture delivered at Oxford, 19 May 1958.

taken to indicate changes both in the level of output and in the techniques used to produce it.

Changes in productivity affect earnings-drift mainly through the system of piece-rates. When for any reason the productivity of pieceworkers increases, until such time as piece rates are revised there will be an increase in the earnings of pieceworkers which will appear as earnings-drift. It is possible although not certain that this will be absorbed the next time that wage negotiations occur, but in the interval between negotiations it is to be expected that there will be earnings-drift arising from changes in the productivity of pieceworkers, especially in rapidly expanding industries and those with a high proportion of pieceworkers. Quite apart from any question of pieceworkers, the installation of new machinery leading to increases in productivity may cause earnings-drift if new wage rates (for both time-workers and pieceworkers) are negotiated within the firm to take account of it, since the wage-rate index takes account only of rates negotiated on a larger scale. But there is no readily available information about bonus payments related to changes in productivity, or bonus payments of any kind.

This absence of direct information about bonus payments causes considerable difficulty, for these are the third remaining component of earnings-drift. To what are they related? The occurrence of earnings-drift (or wage-drift) is frequently attributed to the difficulty employers find in recruiting sufficient labour.[1] Thus employers will make payments above the negotiated wage rate either to attract more labour or to attempt to ensure that those who are already employed do not leave. Such payments will be related to the difficulty the employer encounters in obtaining a sufficient and suitable labour force.

Advertised unfilled vacancies were taken to indicate excess demand for labour. Unfilled vacancies are not an ideal indicator of this in any sense, although they come closest to indicating excess demand for labour in the sense of 'attempts to purchase' by employers. They may be expected to understate changes in demand, for when labour is in very short supply and employers are not hopeful of obtaining more, they may not bother to advertise all the vacancies that they have. Alternatively, employers may advertise the same vacancy in several places. Though unfilled vacancies may reflect unsuccessful attempts to purchase labour, they do not necessarily bear any close relation to the extra amount of labour desired by employers. Yet this would be a difficult concept to use, for the amount of

[1] For example B. C. Roberts, *National Wage Policies in Peace and War*, 1958, pp. 163–4. 'The demand for labour has been such that employers have been ready and able to pay more than was required by their agreements with Trade Unions to recruit and maintain a supply of labour to meet their needs. . . . It is likely that the gap between wage-rates and earnings . . . would be greatly narrowed if unemployment were to rise.'

labour that employers think of hiring must be influenced by the amount that they know is available. It seems better to concentrate on specific attempts to purchase. As Dow and Dicks-Mireaux show,[1]

> There are good *prima facie* reasons for distrusting the statistics of unfilled vacancies since they neither record transactions nor register decisions but represent a sort of queue. . . . But the more closely the behaviour of the vacancy statistics is compared with that of the unemployment figures, the clearer it seems that up to a point they are rather reliable indicators. There is a striking inverse parallelism between the seasonal swings of the two series. It is equally striking that when seasonal movements are removed, changes in demand still appear to be equally reflected in both series.

Since the only indices available that might be relevant to excess demand are advertised unfilled vacancies and combinations of this index with that of registered unemployed, and since it is regional shortages of labour regardless of the presence of or lack of structural maladjustments that are likely to affect earnings-drift,[2] advertised unfilled vacancies alone seemed the most suitable indicator to use.

The hypothesis implicit in the use of this index for excess demand for labour is that the employer makes additional payments with the object of attracting more labour when he finds himself with a considerable number of advertised unfilled vacancies, rather than that the employer needing extra labour increases wage payments and then advertises for the additional workers he needs. In the second case, advertised vacancies, whether filled or unfilled, would be the relevant variable to correlate with wage-drift, but this has nothing to do with *excess* demand. Of course, an increase in the demand for labour is expressed both by changes in hours worked and by advertised unfilled vacancies. To a considerable extent extra work by workers already employed and the employment of additional workers are substitutes, and the employer will prefer to increase overtime to meet a temporary increase in demand for his product, and to increase employment to meet an increased demand which is expected to be permanent. However, it is not *increases* in the demand for labour, but *excess* demand for labour that is normally taken to be associated with earnings-drift, and it is excess demand for labour, that demand which cannot be met permanently by an increase in overtime, which has been taken to be indicated by advertised unfilled vacancies.

[1] J. C. R. Dow and L. A. Dicks-Mireaux, 'The Excess Demand for Labour', *Oxford Economic Papers*, Feb. 1958, p. 2.

[2] Dow and Dicks-Mireaux, op. cit., p. 3. 'A fall in labour maladjustment was the main cause of the divergent trend in the unemployment and vacancy figures. Most of the shift occurred in the early post-war years and is not much in evidence after 1950.' This eliminates another possible disadvantage of using unfilled vacancies alone for much of the period 1948–55; since the degree of maladjustment was not changing, then shifts in the level of the vacancies index cannot be attributed to this source, and it becomes a more reliable indicator of changes in excess demand for labour.

The hypothesis that wage- or earnings-drift is (partially) determined by 'excess profits' is made by Hansen and Rehn. On *a priori* grounds it seems unlikely to prove fruitful. That more than a very small wage drift is impossible without a considerable profit margin, or increased prices resulting in the maintenance of a considerable profit margin, is clear: a firm which is barely breaking even cannot afford to pay higher wages to its workers, but there seems little reason to suppose that the converse holds, that a firm which is making large or increased profits will spend these on higher wages unless it is forced to do so. Although a high level of profits will *permit* a firm to consider an increased level of spending, whether on wages, investment, dividends, or all of these, it is hard to see why even such a firm should grant gratuitous extra wage payments to its employees, especially in a climate of annual wage-rate increases. When there is some other reason for paying wages above the negotiated wage rate, it does not seem unduly optimistic to hope that it can be detected. *A fortiori*, all this is true of the firm which does not regularly make high profits but is faced one year with an improvement in its profit situation. This is the firm which is considered if 'excess profits', measured by variations in the gross profit margin, are correlated with wage-drift. For this firm, there is an additional disincentive to increase wage payments more than is necessary, arising from its uncertainty that the new high level of profits will continue. Even theories which consider the firm almost entirely as a political and social unit rather than an economic unit do not usually regard the ability of a firm to pay higher wages as sufficient reason for it to do so. The result of the Swedish statistical analysis of the relation between 'excess profits' and wage-drift was entirely inconclusive.[1] Nevertheless, rather than rejecting the hypothesis on theoretical grounds alone, it seemed worthwhile to test it.

Various institutional factors are also relevant to earnings-drift, particularly the scope of collective bargaining. If wage rate agreements are made firm by firm, then much of the wage-drift that has become established will tend to be absorbed in the next wage-rate agreement. The wider the scope of the agreement, the less the variations in the conditions confronting the different firms involved can be taken into account. Inter-firm or inter-industry differentials arising from differences in market conditions in both the labour and the product markets for various firms or industries will continue to be expressed as wage- and earnings-drift. The frequency of negotiations is also relevant; the more frequent the negotiations the smaller the wage-drift is likely to be, as wage rates will tend more nearly to keep pace with earnings. Such factors are particularly important when making inter-industry or international comparisons.

[1] Hansen and Rehn, op. cit., pp. 114–16, 133.

It is also possible for earnings-drift to appear because of the inflexibility of the weighting of the wage rate index. Since pieceworkers usually earn more than workers similarly employed who are on time rates, increases in the proportion of pieceworkers in an industry will give rise to earnings-drift unless the wage-rate index used is reweighted to take account of the changed proportions of timeworkers and pieceworkers. Similarly, a decrease in the proportion of women employed in an industry will increase average earnings and cause an apparent earnings-drift unless the wage-rate index is recalculated to take account of the changed proportions of men and women.

The hypothesis that it seemed desirable to test can then be expressed as

$$d = f(h, p, v, q).^1 \tag{1}$$

Further, if drift is a linear function of the other variables,

$$d = \alpha h + \beta p + \gamma v + \delta q + \epsilon. \tag{2}$$

Earnings-drift is defined throughout as the percentage excess in any one year of the ratio of earnings to negotiated wage-rates in that year over the corresponding ratio for the previous year.

Hansen and Rehn's methods, of a signs of change analysis to see whether there is any statistically significant qualitative relationship between the variables, as in equation (1), and then a correlation analysis to try to establish the existence of a linear quantitative relationship between the variables, (equation (2)), would seem appropriate.

III. Signs of Change Analysis

The nature and limitations of the statistics available are discussed in Appendix 1 and the earnings-drifts obtained for each of the S.I.C. orders for each year are shown there in Appendix 2.

By 1957 the cumulative earnings-drift varied from 0·3 points in Leather, Leather Goods, and Fur to 15·0 points in Paper and Printing. The year to year fluctuations in earnings-drift were considerable in all orders and the range of earnings-drifts in any one year was often considerable too. However, the earnings-drifts for the individual orders do move in similar directions from year to year, and they can be compared with changes in the Index of Industrial Production and changes in the level of Gross Domestic Product at 1948 prices for the same years.[2] Such a comparison

[1] d Earnings-drift.
h Hours worked, representing overtime.
p Change in productivity, measured as production per man hour.
v Advertised unfilled vacancies, indicating excess demand for labour.
q Gross profits per man-hour.

[2] See Appendix 2.

shows that the earnings-drifts moved closely parallel to the indices of change in Industrial Production and of change in Gross Domestic Product. The parallelism is particularly marked between earnings-drifts and change in the Index of Industrial Production, except that earnings-drifts were slightly greater for 1954–5 than for 1953–4, while the production increase was slightly smaller. Thus earnings-drift in the aggregate appears to be fairly closely associated with the general level of economic activity. This was only to be expected; it is more interesting to see to what extent what is true for the aggregate is true for its parts and whether any more specific relationships can be formulated.

To test whether there were some statistically significant qualitative relationships between the variables, the signs of change from year to year of all the pairs of variables were examined. The results obtained are shown in Table I. The analysis was conducted not only for all the sixteen S.I.C. groups taken together, but also separately for the eight groups of the sixteen with the greatest increases in production between 1948 and 1957 and the eight groups with the smallest increases by 1957.[1]

In Table I the statistically expected number of observations with the same signs of change is that which would be expected on the hypothesis of no relationship between the directions of change of the variables; a deviation from this value of more than two standard errors represents a 95 per cent. probability that the directory of change of two variables compared are (statistically) significantly related. Thus for all industries taken together, a positive relationship is indicated with at least 95 per cent. probability between the signs of change of all the pairs of variables except changes in productivity and each of hours worked, advertised unfilled vacancies, and gross profits per man-hour. When the industries are split into two groups a different pattern emerges. For the eight S.I.C. orders with the greatest increases in production, there were statistically significant

[1] The eight more rapidly expanding groups were:
IV. Chemicals and Allied Trades (Index of Industrial Production in 1957, 192).
XV. Paper and Printing (169).
VII. Vehicles (165).
XVIII. Gas, Water, and Electricity (163).
XVI. Other Manufacturing Industries (159).
VI. Shipbuilding, Engineering, and Electrical Goods (156).
XIV. Manufacture of Wood and Cork (143).
V. Metal Manufacture (138).
The eight more slowly expanding groups were:
III. Treatment of Non-metalliferous Mining Products (125).
XVII. Building and Contracting (123).
XIII. Food, Drink, and Tobacco (123).
IX. Precision Instruments and Jewellery (122).
XII. Clothing (120).
VIII. Metal Industries not elsewhere specified (116).
X. Textiles (114).
XI. Leather, Leather Goods, and Fur (92).

TABLE I

Signs of Change Analysis

Variables compared	No. of observations with: same signs of change	opposite signs of change	no change in one of the series	statistically expected value[1]	two standard errors	Actual deviation from statistically expected value	Deviation greater than two standard errors
All industries—128 observations							
$d\lambda$	90	35	3	62·5	11·2	27·5	+
dp	79	49	0	64	11·3	15	+
dv	81	47	0	64	11·3	17	+
dq	72	56	0	64	11·3	16	+
λp	69	56	3	62·5	11·2	6·5	
λv	92	33	3	62·5	11·2	29·5	+
λq	85	40	3	62·5	11·2	23·5	+
pv	64	64	0	64	11·3	0	
pq	70	58	0	64	11·3	6	
vq	77	51	0	64	11·3	13	+
Eight orders with greatest increases in production by 1957—64 observations							
$d\lambda$	44	19	1	31·5	7·9	12·5	+
dp	44	20	0	32	8·0	12	+
dv	39	25	0	32	8·0	7	
dq	36	28	0	32	8·0	4	
λp	35	28	1	31·5	7·9	3·5	
λv	47	16	1	31·5	7·9	15·5	+
λq	41	22	1	31·5	7·9	9·5	+
pv	33	31	0	32	8·0	1	
pq	36	28	0	32	8·0	4	
vq	39	25	0	32	8·0	7	
Eight orders with smallest increases in production by 1957—64 observations							
$d\lambda$	46	16	2	31	7·9	15	+
dp	35	29	0	32	8·0	3	
dv	42	22	0	32	8·0	10	+
dq	36	28	0	32	8·0	4	
λp	34	28	2	31	7·9	3	
λv	45	17	2	31	7·9	14	+
λq	44	18	2	31	7·9	13	+
pv	33	31	0	32	8·0	1	
pq	34	30	0	32	8·0	2	
vq	38	26	0	32	8·0	6	

[1] Statistically expected value on the hypothesis of no relation between the variables compared.

relationships (at a 5 per cent. significance level) only between earnings-drift and hours worked, earnings-drift and change in productivity, hours worked, and advertised unfilled vacancies, and hours worked and gross profits per man-hour. For the eight S.I.C. orders with the smallest increases in production, there were statistically significant relationships between earnings-drift and hours worked, earnings-drift and advertised unfilled vacancies, hours worked and advertised unfilled vacancies, and hours worked and gross profits per man-hour. For the eight more rapidly expanding industrial groups, the relationship between earnings-drift and changes in productivity appears important and that between earnings-drift and advertised unfilled vacancies relatively unimportant. For the eight less rapidly expanding industrial groups, the situation is reversed and earnings-

drift appears to be significantly related to advertised unfilled vacancies but not to changes in productivity.

The results of this analysis differ from those which Hansen and Rehn[1] obtained from the Swedish data. They found a significant deviation from the statistically expected value only when the signs of change were compared of wage-drift and of excess demand, measured by vacancies. They did not find a significant relationship between the signs of change of wage-drift and of changes in productivity, nor between the signs of change of wage-drift and of 'excess profits'. That this difference does not arise from the use of earnings-drift instead of wage-drift is shown by the correlation analysis discussed below; the partial correlation coefficients of earnings-drift and changes in productivity holding hours constant and of earnings-drift and unfilled advertised vacancies holding hours constant are both preponderantly positive. In both cases there are three negative correlation coefficients out of sixteen. This suggests that these pairs of variables tend to move in the same directions, and hence that the British data differ significantly from the Swedish. The simplest explanation of this would appear to be that just as wage- and earnings-drift and price increases were greater in the United Kingdom in this period than in Sweden, so all the phenomena associated with inflation were more marked.

IV. Correlation Analysis

The results of the signs of change analysis were sufficiently interesting to suggest that it might be worth conducting a quantitative statistical analysis of the material. Correlation coefficients and partial correlation coefficients were calculated for various combinations of the variables discussed above.[2] The results of this analysis are shown in detail in Appendix 4 and these results confirm qualitatively those of the signs of change analysis. If the hypothesis is made that the sets of sixteen correlation coefficients come from binominal distributions which are equally divided between positive and negative values, the standard deviation of a sample of sixteen observations drawn from such a distribution is 2·0. When the deviations from a division into eight positive and eight negative observations that are actually obtained are greater than 4·0 (i.e. there are twelve or more positive observations or negative observations) it is extremely unlikely that the observations come from a universe equally divided between positive and negative values. Since twelve or more of the values in most of the sets of correlation coefficients relating earnings-drift and hours worked, relating earnings-drift and changes in productivity, and relating earnings-drift and advertised unfilled vacancies, with the effects of

[1] Op. cit., pp. 110–12.

[2] Earnings-drift, hours worked, changes in productivity, advertised unfilled vacancies, and gross profits per man-hour. See Section II and Appendix 1.

various combinations of the other variables eliminated, are positive, there is strong further endorsement of the hypotheses that earnings-drift is associated with overtime working, with increases in productivity, and with excess demand for labour indicated by advertised unfilled vacancies. There is no endorsement of the hypothesis that earnings-drift is in general related to the level of gross profits per man-hour.

If the correlation coefficients are considered quantitatively as well as qualitatively, a more varied picture emerges. A probable relation between the variables, indicated by a correlation coefficient greater than that required at the 50 per cent. significance level,[1] appears frequently. An almost indubitable relationship, indicated by a correlation coefficient greater than that required at the 5 per cent. significance level,[2] appears somewhat infrequently. Signs of auto-correlation between the variables are few, except when hours worked are compared with gross profits per man-hour. (One of the main sources of auto-correlation, a time-trend, has been eliminated from the earnings-drift series and the change in productivity series by the use of proportionate changes in each series since the previous year rather than any cumulative series.) Hence, within the limitations imposed by the deficiencies of the data (discussed in Appendix 1) and the smallness of the number of observations, it appears that there are statistically significant relationships between some of the variables in most of the orders.

Different variables appeared important in different orders. These are shown in Table II. It seems that for all orders except III (Treatment of Non-Metalliferous Mining Products), VIII (Metals n.e.s.), XI (Leather, Leather Goods, and Fur), and XII (Clothing), all four of them industrial orders expanding rather slowly, there was a relatively constant positive relationship between changes in productivity and the size of the earnings-drift. For all orders except IV (Chemicals and Allied Trades), V (Metal Manufacture), VII (Vehicles), X (Textiles), XI (Leather, Leather Goods, and Fur), XV (Paper and Printing), and XVI (Other Manufacturing Industries) there appeared to be a relatively constant positive relationship between the number of advertised unfilled vacancies and the level of earnings-drift. The exceptions are not surprising; with the exception of Textiles and Leather the productivity in these orders is increasing rapidly. Textiles and Leather are both industrial orders where earnings-drift is relatively highly correlated with overtime working and where the number of workers employed actually contracted during the period 1948–57.

Slightly surprising are the lower correlations between hours worked and

[1] 0·26 for 9 observations and 7 degrees of freedom; 0·26 for 6 degrees of freedom; 0·27 for 5 degrees of freedom; 0·27 for 4 degrees of freedom.

[2] 0·67 for 9 observations and 7 degrees of freedom; 0·68 for 6 degrees of freedom; 0·70 for 5 degrees of freedom; 0·72 for 4 degrees of freedom.

TABLE II

Results of Correlation Analyses

S.I.C. Order	*h*	*p*	*v*	*q*
III. Treatment of Non-metalliferous Mining Products	x		x	
IV. Chemicals and Allied Trades		x		
V. Metal Manufacture	x	x		$-q$
VI. Shipbuilding, Engineering, and Electrical Goods	x	x	x	
VII. Vehicles	x	x		x
VIII. Metals n.e.s.	xx		x	$-q$
IX. Precision Instruments and Jewellery		x	x	$-q$
X. Textiles	xx	x		
XI. Leather, Leather Goods, and Fur	xx			
XII. Clothing			x	
XIII. Food, Drink, and Tobacco		x	x	
XIV. Manufacture of Wood and Cork		x	x	
XV. Paper and Printing	xx	x		$-q$
XVI. Other Manufacturing Industries	xx	x		
XVII. Building and Contracting	x	x	x	
XVIII. Gas, Water, and Electricity	x	x	x	

h Hours worked, indicating overtime.
p Change in productivity.
v Advertised unfilled vacancies, indicating excess demand for labour.
q Gross profits per man-hour.

earnings-drift. Only in the five orders marked with two x's in Table II were these correlations high relative to correlations between other variables for the same orders. However, $r_{hd.pvq}$ reached a probably significant level in all orders except IV (Chemicals and Allied Trades), IX (Precision Instruments and Jewellery), XII (Clothing), XIII (Food, Drink, and Tobacco), and XIV (Manufacture of Wood and Cork). Unless the system of overtime payment is markedly different in these industrial orders, the reason for this must lie in the inadequacy of the other variables to provide an explanation of earnings-drift. If some of them are inappropriate, either qualitatively or quantitatively, or if there are some other important factors which have not been taken into account, then a deceptively low correlation between hours worked and earnings-drift could arise even if overtime working always contributes directly to earnings-drift.

Gross profit per man-hour was correlated significantly and positively with earnings-drift only for Order VII (Vehicles). The correlation was significant (at the 50 per cent. level) and negative for four orders, V (Metal Manufacture), VIII (Metals n.e.s.), IX (Precision Instruments and Jewellery), and XV (Paper and Printing). The correlation in Order VII could

arise as a statistical accident (the significance level used is 5 per cent. and there are sixteen correlations of which this is the only significant one); the negative correlation coefficients would suggest that if anything there is a slight inverse relation between the level of gross profits per man-hour and the size of earnings-drift. This would perhaps be explained if earnings-drift were regarded as a substitute for a high level of profits, but in any case there is little explanation needed, since the distribution of the correlation coefficients involving profits scarcely differs from a random one.

All in all, the correlation analysis bears out the results of the signs of change analysis and indicates that in most orders the level of earnings-drift bears a fairly close relationship to some of the other variables. Overtime working, changes in productivity, and excess demand for labour measured by advertised unfilled vacancies are each important in about three-quarters of the orders, but the combination of these variables which is important varies from order to order. This suggests that it may be useful to look in more detail at the individual orders to see how far the particular drift in each can be explained.

V. Examination of Earnings-Drift in the various Orders

The correlation analysis made obvious the considerable differences, quantitative more than qualitative, in the behaviour of the variables relating to different industrial orders. These differences make it desirable to consider each order separately in the hope that when the conditions peculiar to it are taken into account some more satisfactory explanation of earnings-drift can be found, yet there is room even within an order for significant variations in economic conditions. It is impossible to pretend, for example, that the alliance of the stagnant shipbuilding industry with engineering and electrical goods is not uneasy, or that the product markets for wall-paper and newspaper are closely related, or that the labour markets for the production of bricks and of glass are the same. While there may be some homogeneity either of production methods or of product market conditions or of labour market conditions for most of the goods produced within one industrial order, it is rare that more than one or at most two of these sets of conditions will be similar for all the subgroups within the order. It would be preferable to use a finer breakdown, into minimum list headings rather than into industrial orders. The statistics necessary for this are not available, but a less detailed examination of earnings-drift by industrial orders may add something to what can be learned from the study of still larger aggregates.

As a first stage in the examination of the individual orders it seemed desirable to attempt some estimate of the extent to which overtime payments accounted for earnings-drift. If it is assumed that standard hours

are 45 hours per week (for most industrial orders they lie somewhere between 44 and 45 hours per week) and that overtime is paid at time and a half rates, and that the number of hours worked per week exceeds the number of standard hours by x hours, then for x extra hours ($1{\cdot}5x$ 100/45) per cent. [i.e. $10x/3$ per cent.] extra wages will be paid. Similarly if z hours more are worked per week in one year than in the year which preceded it, if standard hours remain 45 hours per week, then $10z/3$ per cent. is a good approximation to the extra wages per week paid in the second year as a result of increased overtime working. Hence an approximation to wage-drift in any year is (earnings-drift—$10z/3$ per cent.) where z is the difference between the number of hours worked per week in that year and the number of hours worked per week in the previous year. Time and a half rates is perhaps rather a generous allowance for overtime payments; the average rate of pay for overtime will lie somewhere between one and a quarter times the time rate and one and a half times. Often the rate of pay is one and a quarter times the time rate for the first two hours of overtime worked and one and a half times thereafter.[1] However, some overtime was worked throughout the period and the measure required is a measure of the effect of the increases in overtime between consecutive years, so that to take such a high estimate of overtime pay is less unrealistic than might appear. It is impossible to make any explicit allowance for the overtime rates of pay for pieceworkers; it is assumed implicitly in the calculation that they are paid at one and one half times their normal rate for any overtime work that they do. The extent of wage-drift, using this approximation for overtime, is shown in Appendix 3.

It remains to explain the wage-drift. If the hypothesis is made that all wage-drift arises from increases in the productivity of pieceworkers, then if there is a 3 per cent. wage-drift and 25 per cent. pieceworkers, this is equivalent to a 12 per cent. (i.e. 300/25 per cent.) wage-drift for each of these pieceworkers. Assuming that increases in productivity are equally distributed among all the workers in an industry, then if there has been a 20 per cent. increase in productivity, the productivity of each pieceworker will have increased by 20 per cent. In this particular example the wage-drift could be quite adequately explained by increases in the productivity of pieceworkers alone; there has been an 8 per cent. greater increase in the production per hour of each pieceworker than in his extra earnings. Still more will this argument hold if increases in productivity tend to be concentrated, in any measurable sense, among pieceworkers. Of course the presence of other factors causing wage-drift is not ruled out; they merely become more difficult to detect and it is not necessary that they be there.

[1] See *Time Rates of Wages and Hours of Working* (Ministry of Labour) for any year during the period 1948–57.

If on the other hand the increase in productivity in the industry has been only 5 per cent., then the increase in the productivity of pieceworkers is less than the wage-drift, and factors other than changes in productivity must necessarily have contributed to it.

This adjustment was applied to the data for the different industrial orders. It was found that in a considerable number of instances, the increases in productivity from year to year, even with the extreme assumption that all the wage-drift was concentrated in the pieceworkers' wage payments, were sufficient to account for the wage-drift. Negative wage-drifts have been ignored and assumed to require no further explanation. This has been done not because it is always clear how they arise, but rather because it is unclear how far the effects of productivity changes or other relevant factors on wage-drift are reversible and there are no simplifying assumptions that can be made without considerable additional analysis. The results of the correlation analysis and to a lesser extent of the signs of change analysis indicated that little precision could be expected in attempting to break down the wage-drift into its component parts. It is for this reason, together with the deficiencies of the statistical data discussed in Appendix 1, that wage-drifts of less than 0·5 points have been ignored.

In Table III, *h* has been used to indicate those earnings-drifts that can be accounted for, to within 0·5 points, by overtime working; *p* has been used to indicate those of the remaining wage-drifts which can be accounted for by changes in the productivity of pieceworkers, using the extreme assumption described above. This assumption will tend to underestimate the effect of productivity changes on wage-drift, since timeworkers' earnings may also be increased if productivity increases.

There remained about one-third of the earnings-drifts for which overtime working and changes in productivity provided insufficient explanation. Some of these earnings-drifts were associated with numbers of advertised unfilled vacancies for the same year which were unusually high for the particular industry group concerned, or which represented a considerable increase over the number of advertised unfilled vacancies for the previous year. It seemed reasonable to infer that these earnings-drifts arose as a response to excess demand for labour. They have been indicated in Table III by *v*.

The three factors of overtime working, changes in productivity, and excess demand for labour provided an apparently satisfactory explanation of 122 out of the 144 earnings-drifts under consideration. Only for six S.I.C. orders of the sixteen examined were there more than three unexplained earnings-drifts. These orders were: Treatment of Non-metalliferous Mining Products; Metal Manufacture, Metals n.e.s.; Textiles; Food, Drink, and Tobacco; and Paper and Printing. Only for 3 years, 1952, 1956,

and 1957, were more than four of the earnings-drifts unexplained. Nevertheless, it appeared desirable to look for other factors which might have influenced earnings-drift in the hope that the number of observations unexplained could be reduced still further.

Despite the discouraging results obtained in the signs of change analysis and the correlation analysis when the relationship of gross profits per man-hour to earnings-drift was examined and despite the difficulty of formulating a satisfactory explanation of why a high level of gross profits per man-hour should give rise to earnings-drift, it still seemed worthwhile to see whether the series of gross profit per man-hour showed any startling relation to the unexplained earnings-drifts. In two cases they did so. In Paper and Printing there was a marked increase in gross profits per man-hour in 1954, to a level which was maintained until 1957. It is the period 1954–7 for which an explanation is required. Similarly, in Building and Contracting there was a marked increase in gross profits per man-hour in 1956 and 1957, the years for which explanations of earnings-drifts were needed. (There was also a marked increase in 1953, a year in which overtime working supplied a sufficient explanation of earnings-drift.) In no other cases was a relationship between high or increased profits and an unexplained earnings-drift discernible. It may be possible that in these two S.I.C. orders an improved profit situation encouraged employers to make bonus payments regardless of changes in productivity or the degree of excess demand for labour, although there appears no particular reason why this should occur. The appropriate earnings-drifts have been indicated by 'q' in Table III.

More satisfactory in theory as explanations of earnings-drifts are such structural factors as changes in the proportion of women employed, changes in the proportion of skilled workers, and changes in the proportion of pieceworkers. However, the wage-rate index used is calculated in such a way as to take account each year of changes in the proportion of women employed,[1] so that this factor in causing earnings-drift is eliminated.[2] There is no allowance made for changes in the skill mix; an increase in the proportion of more highly paid or more highly skilled workers would give rise to earnings-drift, but there was no information available to suggest to what extent this had been occurring.

Changes in the proportion of pieceworkers in an industry may have been important in causing earnings-drift. The percentage change by 1955 in the proportion of pieceworkers is shown in Table III. Although there is no

[1] See Appendix 1.

[2] Even if it were not, there are only four S.I.C. orders (Treatment of Non-metalliferous Mining Products; Chemicals and Allied Trades; Textiles; Paper and Printing) where the proportion of women employed declined during the period (hence increasing average earnings), and the greatest decrease in the proportion, that in Textiles, was only 1·5 per cent.

TABLE III

An Attempt at the Explanation of Earnings-drifts

S.I.C. Order	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*
III. Treatment of Non-metalliferous Mining Products			*h'*	*h*	*p*	*v*	*p*		*p'*
IV. Chemicals and Allied Trades	*v*	*h*	*p*	*h*	*p*	*p*	*v*	*v*	*p*
V. Metal Manufacture	*h*	*v*	*h*	*v'*		*p*	*h*		*h'*
VI. Shipbuilding, Engineering, and Electrical Goods	*p*	*p*	*h*		*h*	*p*	*p*		*p*
VII. Vehicles	*h*	*p*	*h*	*h*	*h*	*p*	*v*	*h'*	*p*
VIII. Metals n.e.s.		*p*	*h*	*h'*	*h*	*v p'*	*p*	*h'*	*h'*
IX. Precision Instruments and Jewellery	*v*	*h'*	*v*	*h*	*p*	*h*	*v*	*h*	*h*
X. Textiles	*v*	*p*	*v*		*h*			*h*	
XI. Leather, Leather Goods, and Fur	*h*	*v*	*v*	*h*	*h*	*p*	*v*		*h*
XII. Clothing	*v*	*v*	*p*	*h*	*h*	*h*	*p*	*h*	*h*
XIII. Food, Drink, and Tobacco	*v*	*h'*	*v*		*h*	*v*	*v*		
XIV. Manufacture of Wood and Cork	*h*		*v*	*h*	*h*	*p*	*v*	*h*	
XV. Paper and Printing	*h*	*p*	*h*	*h'*	*h*	*v' q'*	*v q'*	*q'*	*q'*
XVI. Other Manufacturing Industries	*h*	*p*	*h*		*p*	*h*	*p*	*p'*	*p*
XVII. Building and Contracting	*v*	*v*	*v*	*h*	*h*	*h*	*h'*	*q'*	*q'*
XVIII. Gas, Water, and Electricity	*h*	*h*	*v*	*h*	*h*	*h'*	*h'*	*h*	

h Overtime working is sufficient to account for the earnings-drift.
p Changes in productivity are sufficient to account for the wage-drift.
v The wage-drift is not fully accounted for by changes in productivity, but there is an abnormally high level of advertised unfilled vacancies or a considerable increase in unfilled vacancies since the previous year.
q' The wage-drift is not accounted for by *p* or *v* but there is an abnormally high level of gross profits per man-hour, or a considerable increase in these since the previous year.
h', *p'* Indicate that *h*, *p* respectively account for the drift if residuals of 0·5 or less are neglected.
v' Indicates that the level of vacancies, although fairly high, is not outstandingly high.

readily available information on the relative earnings of pieceworkers and timeworkers in the various industries, it is generally true that if timeworkers are put on to piece rates, their earnings will not diminish. It is harder to generalize about the effects on earnings of the expansion of the piecework sector of an industry (independent of any shift of workers from one system of wage payment to the other), but it remains probable that an increase in the proportion of pieceworkers compounded of these two factors will probably lead to an increase in average earnings. The effect of this will presumably be most marked in the industries with the greatest increase in the proportion of pieceworkers. The S.I.C. orders where this increase was greatest by 1955 are, in order of size of increase: Building and Contracting; Chemicals and Allied Trades; Manufacture of Wood and Cork; Paper and Printing; Food, Drink, and Tobacco; Metal Manufacture; Clothing. This is encouraging, since for all these orders except Clothing, and particularly for Building; Paper and Printing; and Food, Drink, and Tobacco, some explanation of earnings-drift other than overtime working, changes in productivity, and excess demand for labour was required in the latter portion of the period.

There are two other interrelated groups of factors which might account

TABLE III (*continued*)

S.I.C. Order	A	B	C	D	E	F	G
III. Treatment of Non-metalliferous Mining Products	3–5	1	M	x		8·5−	13·5−
IV. Chemicals and Allied Trades	0	5	L			8·0+	12·0+
V. Metal Manufacture	2–4	3	L			1·0	3·5+
VI. Shipbuilding, Engineering, and Electrical Goods	2	1	L			4·5+	3·5+
VII. Vehicles	0–1	−2	L			2·5−	1·0
VIII. Metals n.e.s.	1–4	1	S	x	x	4·5−	11·0+
IX. Precision Instruments and Jewellery	0–1	0	S	x	x	7·5−	4·0·-
X. Textiles	4	1	S–M	x	x	14·5+	7·5−
XI. Leather, Leather Goods, and Fur	1	−1	S	x	x	13·0−	12·5−
XII. Clothing	0	3	S	x	x	13·0−	9·0−
XIII. Food, Drink, and Tobacco	3–4	4	M		x	14·5+	14·0+
XIV. Manufacture of Wood and Cork	2	5	S	x	x	11·0	5·0+
XV. Paper and Printing	2–4	5	M			2·5+	7·5+
XVI. Other Manufacturing Industries	1–2	0	L			6·0	10·0−
XVII. Building and Contracting	2–3	10	S	x	n.a.	11·5+	16·0
XVIII. Gas, Water, and Electricity	1–3	1	n.a.		n.a.	13·0+	5·5−

A Number of earnings-drifts unexplained by A, *p*, *v*.
B Increase in the proportion of pieceworkers by 1955 (%).
C Average size of plants (S, small; M, medium; L, large; n.a., not available).
D Ratio of unfilled vacancies to employment greater than 2 per cent.
E Relatively high labour turnover.
F Earnings Rank (average of 1948 and 1957 positions): Men.
G Earnings Rank (average of 1948 and 1957 positions): Women.
In F and G an upward movement between 1948 and 1957 is indicated by +, a downward movement by −.

for the prevalence of unexplained earnings-drifts in some industrial orders. If the industrial orders are classified by the average size of their plants[1] it is found that those industries where small or medium plants predominate are those which have a relatively high ratio of unfilled advertised vacancies to employment for most years of the period.[2] These orders also tend to be those where the number of earnings-drifts not yet adequately explained is relatively great. A possible hypothesis is that in such industries there is room for considerable variation in the wage payments made at a large number of separate plants, and that these variations arise in order to meet differences in local conditions. It might be expected that there would be a high ratio of advertised unfilled vacancies in industrial orders where there are many small plants, since vacancies which can be filled from within a large plant have to be advertised by a small one, and because industries made up of small plants tend to be widely dispersed, while there is no reason why the labour that they wish to employ should be correspondingly distributed.

[1] An approximate classification can be made using the information given in Appendix H (pp. 329–33) of *Concentration in British Industry* by Richard Evely and I. M. D. Little (Cambridge University Press, 1960).

[2] The criterion employed was a ratio of advertised unfilled vacancies to employment greater than 2 per cent. in both 1949 and 1955.

However, there is a stronger reason why industries made up of small plants should tend to have high ratios of vacancies to employment and unexpectedly high rates of earnings-drift. In Table III the industrial orders have been ranked by the level of earnings both at the beginning (1948) and the end (1957) of the period and the ranks for the two years averaged for each order. Men's and women's earnings have been considered separately, since average earnings for all workers will be unduly low in industries employing a high proportion of women, while in fact the labour markets for men and for women are quite distinct. It can be seen that the industries with large amounts of unexplained drift, with a high ratio of vacancies to employment and with small plants, tend to be ranked low in the scale of earnings. It seems plausible that in these orders particularly, earnings-drift will arise to retain labour and to attract it from other industries, and that the existence of a large number of smaller plants makes easier the occurrence of a localized drift which is not readily absorbed by an increase in wage rates. In industries with larger, fewer plants there will tend to be less variation in the conditions facing the different plants and centralized bargaining will be able to take account of the needs of a greater proportion of the industry.

It appears that a considerable proportion of the earnings-drift in the period 1948–57 can be explained in terms of overtime working, changes in the productivity of pieceworkers, and variations in the level of excess demand for labour. However the explanation provided by these three factors does not seem sufficient (especially as no attempt has been made to explain negative earnings-drift by any of these factors except overtime working). There is a paucity of readily available information on certain other factors which might help to account for the observed discrepancies, namely, changes in the methods of wage-payment and in the proportions of workers employed at different rates. There is also no information on the distribution of earnings-drift between firms of different sizes. It appears probable that the level of earnings relative to other industries is an important factor in giving rise to drift. Without some way of analysing the response of earnings-drift to methods of wage payment, and considerably more knowledge of the distribution of earnings-drift between different firms within an industry, it is impossible to provide a completely satisfactory quantitative analysis of earnings-drift.

VII. Conclusions

This paper has been an attempt to discover how earnings-drift arises and hence what its significance is. Data for the United Kingdom for 1948–57 were analysed first by the methods used for the corresponding Swedish data for 1948–55 by Hansen and Rehn. This was done both for the sake

of the results for the United Kingdom and also to see whether any sort of international comparison was appropriate. Then a more rough and ready but less aggregative analysis of the earnings-drift in the individual industrial orders was undertaken.

The signs of change analysis and the correlation analysis showed that earnings-drift was associated with overtime working, with increases in productivity, and with the number of advertised unfilled vacancies. The degree of association between earnings-drift and productivity was far more marked than for the Swedish data, and this, together with the fact that wage-drift was considerably higher in the United Kingdom than in Sweden, was the only useful international comparison that emerged.

The results of the correlation analysis showed considerable variation from order to order. Changes in productivity appeared to be significantly related to earnings-drift in all except some of the more slowly expanding industrial orders. Advertised unfilled vacancies, indicating excess demand for labour, appeared to be significantly related to earnings-drift except in some of the industrial orders where productivity was increasing the most rapidly and in the two industrial orders in which employment actually declined during the period 1948–57. There appeared to be no criterion for distinguishing systematically those industrial orders for which hours worked, indicating the amount of overtime, were significantly correlated with earnings-drift. Although for eleven orders out of the sixteen examined a probably significant correlation between hours worked and earnings-drift was found, none the less the significant correlation coefficients were fewer and numerically lower in value than had been suggested by *a priori* reasoning, and a possible explanation of this would lie in the inadequacy of the variables considered and the ways in which they were indicated. Gross profits per man-hour did not appear to be significantly correlated with earnings-drift.

It might have been worthwhile to calculate regression equations for the individual orders; it would certainly not have been informative to calculate one for all industries taken together. Even to calculate them for individual orders would not have been very satisfactory; a finer breakdown by industry might be expected to yield a better fit. In practice it did not seem worthwhile even to calculate regression equations for the various orders; most of the correlation coefficients, while great enough to indicate a probable relation between the variables compared, exceeded this value by only a narrow margin.

When the earnings-drifts were examined in the separate orders, it was possible to eliminate the effect of overtime. A considerable proportion of the residual wage-drifts could be explained by productivity changes on the extreme assumption that the effects on earnings of a change in productivity

are all concentrated in the pieceworkers while the earnings-drift is calculated on the basis of the earnings of all workers. Many of the wage-drifts which still remained after allowing for the effects of changes in the productivity of pieceworkers were associated with a particularly high level of advertised unfilled vacancies for that order. Overtime working, changes in productivity, and the level of advertised unfilled vacancies, allowed for in these various crude ways explained about 122 of the 144 earnings-drifts.

Factors which may have helped to account for the unexplained drifts are increases in the proportion of pieceworkers employed, or, since the wage-rate index is not reweighted to take account of changes in the skill mix, increases in the proportion of more highly skilled workers employed. Also some industrial orders will tend to have a bias towards a high level of wage-drift. These are the industrial orders with small plants, with many piecemeal local negotiations after a central wage bargain has been struck, and with low relative earnings. It was indeed industrial orders conforming to this pattern which had the largest number of unexplained wage-drifts.

One question which was not discussed at all was the extent to which increases in earnings-drift were a substitute for increases in wage rates and to what extent earnings-drift still remained immediately after increases in wage rates.

In terms of the expressions set out at the end of Section II it appeared that $d = f(h, p, v)$ and perhaps that $d = \alpha h + \beta p + \gamma v + \epsilon$ where α, β, and γ are positive, although some of them for any one industrial order were small enough to be negligible, and where ϵ was compounded of the effects of the several factors (changes in the proportion of pieceworkers, changes in the skill mix, the scope of negotiations, the relative level of earnings) discussed in the previous paragraph.

Does earnings-drift then play the role traditionally assigned to it, that of a simple indicator of excess demand for labour? It appears not. Although the level of advertised unfilled vacancies may be a simple indicator of excess demand for labour, and although the residual error in the function above is partially related to difficulties in obtaining suitable labour, yet overtime working, while a substitute for the employment of increased numbers of workers, represents a satisfied demand for labour derived from demand for the product and is not related to *excess* demand for labour. Changes in productivity, in so far as they are related to demand at all, are related directly to demand for the product. Earnings-drift is undeniably associated in some way with 'the general level of demand', but it is a gross oversimplification, especially in the more rapidly expanding sectors of the economy with relatively high earnings, to suggest that it is related directly or exclusively to the inability of employers to obtain suitable labour.

APPENDIX 1

Statistical Sources

The main series used were:

Series	*Source*	*Frequency*
Wage rates	Manchester wage-rate index (Manchester School, May 1958 and May 1959)	Annual
Earnings	Ministry of Labour Gazette	April and October only
Hours worked	Ministry of Labour Gazette	April and October only
Employment	Ministry of Labour Gazette	Monthly
Unfilled Vacancies	Ministry of Labour Gazette (1952–7); figures supplied by the Ministry of Labour to N.I.E.S.R. (1949–51); figures supplied by the Ministry of Labour (1948)	Monthly
Production	Index of Industrial Production	Monthly
Gross Profit	National Income Blue Book	Annual

Although many of these statistics were available for several other S.I.C. orders, the study had to be confined to the fourteen manufacturing orders (III to XVI inclusive), together with Order XVII (Building and Contracting) and Order XVIII (Gas, Water, and Electricity) since one or more of the series was not available for each of the other orders or was in some way not comparable with the other series for that order.

The Manchester wage-rate index is built up from some 4,000 different series, and gives aggregate rates for most orders of the Standard Industrial Classification. Only annual rates are published for years before 1955, although thereafter monthly figures are available. The way in which the index is built up is not without influences on the level of estimated earnings-drift. For example, 'for some industries there are both rates fixed by Statutory authority and rates fixed by collective bargaining. Where both sets of rates were complete and easily manageable we have included both. Where the collective bargain included complicated local agreements we have used the Statutory rates only'.[1] Since statutory rates are minimum rates the actual wage rates, however complicated, will be higher and the estimate of earnings-drift will include some drift which has been absorbed by local wage-rate negotiations. Similarly, piece rates are not always mentioned in collective agreements but are negotiated at district or firm level. Further complications arise from the weighting of the series; 1948 base weights are used. Not all changes in the proportions of an industry on different rates will have serious consequences for earnings-drift, but changes in the proportions of an industry on piece rates and on time rates are particularly likely to have important effects. Where the proportion of pieceworkers has decreased, earnings-drift will be over-estimated. No parallel problem arises from changes in the proportions of men and women employed, since wage-rate series for each of these are calculated separately and then combined in proportion to the respective wage bills.

Since only an annual series of wage rates is available, it was impossible to obtain any estimate of earnings-drift for shorter intervals than a year. Unfortunately there are no annual figures (based on monthly figures) of earnings. The closest to an annual series that it was possible to obtain was a simple average of the April and the October figures for each year. The statistics of hours worked were treated similarly. The question then arose of how to deal with the remaining series, all of which were available monthly. For want of any better alternative, it was decided to treat the figures of employment and unfilled vacancies exactly like those of earnings and hours

[1] Ely Devons and R. C. Ogley, *An Index of Wage-Rates by Industries*, Manchester School, May 1958, p. 81.

worked. Only April and October figures were taken and these were averaged for each year. Thus all the earnings, hours worked, employment, and unfilled vacancies series used are strictly comparable. The production index raised a bigger problem. It was needed for the calculation of productivity, taken as production per man-hour, and so had to be used in conjunction with the series for hours worked and for employment. The alternatives were to calculate productivities for April and for October of each year and then to average them, to calculate an annual value for productivity using the average of April and October figures for each of the series concerned; or to calculate an annual value for productivity using an annual average for production and the average of April and October figures for employment and for hours worked. The last of these alternatives was adopted, that which combined annual changes in production with the closest approximation available to an annual average of man-hours worked. The main reason for this choice was that monthly figures for the Index of Industrial Production are not available with base 1948 until January 1950, although annual figures are available for 1948 and 1949 as well. It seemed better to use these than to attempt to estimate the monthly figures for 1948 and 1949 from the Interim Index of Industrial Production.

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APPENDIX 2

Earnings-Drift

S.I.C. Order	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*
III. Treatment of Non-metalliferous Mining Products	2·3	2·6	1·8	−1·6	2·0	2·3	1·5	0·5	−0·4
IV. Chemicals and Allied Trades	2·7	1·3	1·9	−3·0	3·7	2·0	3·4	0·6	0·2
V. Metal Manufacture	−0·9	3·1	−1·9	1·3	1·1	3·1	1·0	0·1	−0·2
VI. Shipbuilding, Engineering, and Electrical Goods	−0·2	2·9	0·2	0·3	1·3	2·7	2·1	0·7	−1·6
VII. Vehicles	−1·7	4·8	−0·5	−1·4	2·0	1·6	3·8	−3·0	1·6
VIII. Metals n.e.s.	2·7	2·5	0·1	−0·9	0·6	3·8	1·3	−0·8	−0·2
IX. Precision Instruments and Jewellery	4·1	2·8	3·6	−2·6	1·9	1·1	2·5	−3·4	−1·8
X. Textiles	1·7	3·0	1·0	−4·4	5·2	2·4	0·5	−2·2	3·2
XI. Leather, Leather Goods, and Fur	−2·2	2·2	0·5	−4·1	1·5	1·2	2·5	0·1	−1·4
XII. Clothing	3·5	2·9	−0·4	−1·4	1·7	−1·8	1·6	−0·8	−1·9
XIII. Food, Drink, and Tobacco	1·3	1·4	0·9	−1·4	−0·3	2·1	1·9	5·9	1·1
XIV. Manufacture of Wood and Cork	0·9	3·4	1·4	−4·3	1·7	2·1	1·2	−2·1	−0·2
XV. Paper and Printing	2·9	1·9	−0·8	2·9	3·4	3·8	3·1	−0·1	0·8
XVI. Other Manufacturing Industries	−1·0	4·5	0·6	−1·3	3·9	2·1	2·7	−1·4	1·7
XVII. Building and Contracting	2·4	3·3	4·0	−1·6	1·4	1·1	3·2	1·5	−2·8
XVIII. Gas, Water, and Electricity	0	1·3	4·6	−3·0	−0·2	1·9	2·1	−2·4	0·6
Earning-drift, all industries	1·5	2·3	1·5	−1·0	1·5	2·0	2·7	−0·3	0
Change in Index of Industrial Production[1]	6·0	7·5	2·6	−2·6	6·1	7·4	5·4	−0·7	1·5
Change in Gross Domestic product at 1948 prices[1]	3·6	2·7	3·9	0·3	4·0	4·0	3·5	1·9	1·3

[1] Calculated as the percentage excess over 100 per cent. of the ratio of the index for one year to the index for the preceding year.

APPENDIX 3

Wage-Drift (Earnings-drift corrected for Overtime working)

S.I.C. Order	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*
III. Treatment of Non-metalliferous Mining Products	1·6	1·6	0·5	−0·6	0·7	1·0	0·5	0·8	0·6
IV. Chemicals and Allied Trades	1·4	−0·4	0·9	−0·7	1·7	0·3	2·4	1·6	0·5
V. Metal Manufacture	−0·6	4·7	−2·2	0·6	1·8	0·8	−0·3	1·1	0·5
VI. Shipbuilding and Electrical Goods	0·1	0·2	−1·8	2·0	0	0·7	1·4	1·0	0·3
VII. Vehicles	−2·0	2·8	−1·8	−0·4	−0·3	0·3	3·1	0	1·2
VIII. Metals n.e.s.	1·7	0·5	−0·2	0·5	−1·7	0·8	2·3	0·2	0·2
IX. Precision Instruments and Jewellery	3·1	0·5	2·9	−1·3	0·2	−1·6	3·8	−2·1	−0·5
X. Textiles	2·4	2·0	1·7	0·6	−0·8	2·1	1·8	−1·5	2·9
XI. Leather, Leather Goods, and Fur	−2·9	1·2	1·2	−2·1	−1·2	0·5	2·5	1·6	−1·4
XII. Clothing	3·5	2·6	1·3	−1·1	−0·6	−1·1	1·3	−0·1	−0·9
XIII. Food, Drink, and Tobacco	0·6	0·4	0·6	0·6	−2·0	1·1	1·6	6·6	1·4
XIV. Manufacture of Wood and Cork	−0·8	1·7	2·1	−4·0	0	1·1	1·9	−0·4	2·8
XV. Paper and Printing	−0·1	1·6	−1·5	0·1	−0·3	2·1	−2·8	2·3	1·1
XVI. Other Manufacturing Industries	−0·3	2·2	−0·1	1·0	1·2	−0·2	3·0	1·3	1·4
XVII. Building and Contracting	2·7	1·0	1·3	−0·6	−0·3	−0·2	0·5	1·1	4·0
XVIII. Gas, Water, and Electricity	−1·0	−0·4	2·6	−1·7	−0·5	0·2	0·4	−0·4	0·6

APPENDIX 4

Correlation Coefficients

	S.I.C. Order																
	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	*N*
r_{dh}	−0·13	0·33	0·17	−0·17	0·42	0·15	0·01	0·83	0·91	0·67	0·58	0·04	0·72	0·54	−0·23	0·29	13
r_{dp}	0·46	0·66	0·44	0·29	0·58	0·18	0·47	0·77	−0·01	0·05	0·25	0·78	0·91	0·61	−0·43	−0·55	13
r_{dv}	0·61	0·31	−0·33	0·17	−0·10	0·58	0·56	0·34	0·45	0·92	0·56	0·55	0·33	0·34	0·84	0·71	14
r_{dq}	−0·19	0·09	−0·20	−0·14	0·55	−0·66	−0·48	0·28	0·28	0·01	0·49	0·16	0·01	0·21	−0·45	−0·28	9
r_{hp}	−0·04	0·00	0·46	0·07	0·08	0·19	0·31	0·84	0·19	0·03	−0·09	0·03	0·61	0·34	−0·17	0·22	14
r_{hv}	−0·37	0·24	0·09	0·71	0·48	−0·18	0·17	0·39	0·51	0·73	0·63	−0·21	0·15	0·31	−0·58	−0·05	11
r_{hq}	0·97	0·89	0·55	−0·05	0·90	0·46	0·36	0·37	0·22	0·15	0·61	0·01	0·65	0·42	0·90	−0·16	14
r_{pv}	0·25	−0·18	−0·19	0·39	−0·54	0·74	0·03	0·41	−0·35	0·05	−0·51	0·39	0·53	0·57	−0·29	−0·66	9
r_{pq}	−0·07	−0·11	0·44	−0·69	−0·02	−0·10	−0·04	0·21	−0·39	0·44	0·57	0·34	0·08	0·21	0·03	0·44	9
r_{vq}	−0·30	−0·16	−0·20	−0·39	0·47	−0·58	0·17	0·65	0·70	0·02	0·00	−0·01	0·08	0·21	−0·73	−0·45	8
$r_{dh.p}$	−0·12	0·45	−0·04	−0·20	0·47	0·12	−0·16	0·53	0·93	0·67	0·62	0·02	0·50	0·45	−0·34	0·51	11
$r_{dh.v}$	0·13	0·28	0·21	−0·42	0·54	0·32	−0·10	0·80	0·89	0·00	0·36	0·19	0·71	0·49	0·59	0·47	14
$r_{dh.q}$	0·26	0·56	0·34	−0·18	−0·20	0·67	0·23	0·81	0·91	0·68	0·41	0·04	0·94	0·52	0·46	0·26	14
$r_{dp.h}$	0·46	0·70	0·42	0·30	0·60	0·16	0·49	0·23	−0·46	0·04	0·37	0·78	0·85	0·54	−0·49	−0·66	13
$r_{dp.v}$	0·40	0·76	0·41	0·24	0·63	−0·46	0·55	0·73	0·17	0·02	0·74	0·74	0·91	0·54	−0·36	−0·15	13
$r_{dp.q}$	0·46	0·67	0·61	0·27	0·70	0·15	0·52	0·76	0·11	0·05	−0·05	0·78	0·91	0·59	−0·47	−0·50	13
$r_{dv.h}$	0·61	0·25	−0·36	0·42	−0·38	0·63	0·56	0·35	−0·05	0·85	0·30	0·58	0·32	0·22	0·90	0·76	13
$r_{dv.p}$	0·58	0·57	−0·29	0·07	0·31	0·68	0·62	0·04	0·47	0·92	0·82	0·43	0·40	−0·01	0·83	0·56	14
$r_{dv.q}$	0·59	0·33	−0·39	0·13	−0·49	0·32	0·74	0·22	0·36	0·92	0·64	0·56	0·33	0·31	0·84	0·69	14
$r_{dq.h}$	−0·29	−0·48	−0·36	−0·15	0·43	−0·83	−0·52	−0·05	0·22	−0·12	0·21	0·16	−0·87	−0·03	−0·58	−0·25	4
$r_{dq.p}$	−0·18	0·21	−0·50	0·09	0·69	−0·66	−0·53	0·19	0·30	−0·01	0·45	−0·17	−0·16	0·10	−0·49	−0·05	7
$r_{dq.v}$	−0·02	0·14	−0·29	−0·08	0·68	−0·49	−0·70	0·09	−0·04	−0·03	0·60	0·21	−0·02	0·15	0·45	0·07	8

APPENDIX 4

Correlation Coefficients (cont.)

	S.I.C. Order																
	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	*N*
$r_{dh.pv}$	0·12	0·39′	0·02	−0·37′	0·36′	0·71″	−0·34′	0·53′	0·93″	−0·01	0·16	0·14	0·45′	0·46′	0·52′	0·53′	13
$r_{dh.pq}$	0·24	0·58′	0·22	−0·20	−0·51′	0·66′	0·06	0·50′	0·93″	0·68′	0·50′	0·02	0·96″	0·45′	0·31′	0·52′	14
$r_{dh.vq}$	0·66′	0·56′	0·49′	−0·42′	−0·15	0·67′	0·20	0·80″	0·91″	0·00	−0·23	0·20	0·95″	0·48′	0·45′	0·49′	13
$r_{dp.hv}$	0·40′	0·78′	0·36′	−0·12	0·51′	−0·75″	0·61′	0·23	−0·57′	0·02	0·70″	0·73″	0·85″	0·51′	−0·13	−0·31	11
$r_{dp.hq}$	0·45′	0·68′	0·57′	0·28′	0·78″	−0·04	0·48′	0·22	−0·41′	0·11	0·33	0·78″	0·94″	0·54′	−0·32′	−0·64′	12
$r_{dp.vq}$	0·40′	0·80′	0·61′	0·25	0·59′	−0·23	0·73″	0·74″	0·17	0·04	0·58′	0·73″	0·91″	0·53′	−0·27	−0·16	13
$r_{dv.hp}$	0·58′	0·53′	−0·28′	0·33′	0·03	0·85″	0·66′	0·00	−0·38′	0·85″	0·69′	0·45′	−0·33′	−0·09	0·86″	0·57′	12
$r_{dv.hq}$	0·78″	−0·32′	−0·52′	0·41′	−0·47′	0·33′	0·73″	0·08	−0·29′	0·86″	0·58′	0·59′	0·59′	0·22	0·84″	0·75″	12
$r_{dv.pq}$	0·56′	0·64′	−0·40′	0·08	−0·11	0·36′	0·84″	−0·11	0·38′	0·92″	0·78″	0·41′	−0·40′	−0·02	0·81″	0·56′	11
$r_{dq.hp}$	−0·27	−0·45′	−0·53′	0·09	0·71″	−0·82″	−0·51′	0·00	0·02	−0·16	−0·13	−0·17	−0·95″	−0·09	−0·47′	0·12	5
$r_{dq.he}$	−0·65′	0·51′	−0·52′	0·08	0·51′	−0·73″	−0·72″	0·09	0·35′	−0·03	0·55′	0·21	−0·90″	−0·05	−0·14	0·19	8
$r_{dq.pv}$	−0·02	0·40′	−0·56′	0·10	0·65′	−0·30′	−0·82″	0·22	−0·01	−0·04	0·22	−0·11	−0·16	0·10	0·39′	0·10	8
$r_{dh.pvq}$	0·64′	−0·04	0·39′	−0·40′	−0·51′	0·81″	−0·08	0·49′	0·94″	0·00	−0·02	0·14	0·95″	0·46′	0·39′	0·58′	11
$r_{dp.hvq}$	0·35′	0·69′	0·55′	0·21	0·71′	−0·65′	0·72″	0·21	−0·57′	0·04	0·55′	0·72″	0·91″	0·51′	−0·11	−0·38′	12
$r_{dv.hpq}$	0·75″	0·34′	−0·50′	0·37′	0·10	0·69′	0·84″	0·00	−0·50′	0·84″	0·69′	0·43′	0·01	−0·09	0·82″	0·61′	13
$r_{dq.hpv}$	−0·63′	0·11	−0·65′	0·19	0·71′	−0·62′	−0·79″	0·00	0·34′	−0·04	0·15	−0·11	−0·94″	−0·08	−0·12	0·30′	7

d Earnings-drift.
h Hours worked.
p Change in productivity.
v Advertised unfilled vacancies.
q Gross profits per man-hour.

′ Significant at 50 per cent. significance level.
″ Significant at 5 per cent. significance level.
N Number of correlation coefficients > 0.

CASH-FLOW IN A CONTROLLED ECONOMY
THE CASE OF HUNGARY

By Dr. JANOS BARACS

In countries with a planned economy it is possible to draw inferences about the distribution of the national income from fluctuations in the circulation of cash (i.e. notes and coins). Cash in these countries is used mainly for transactions between the socialist sector and the general population. Within the socialist sector, i.e. between firms and state organizations, payments are (apart from the settlement of small items) made through accounts at the central bank, without the use of cash. Transactions between private individuals are insignificant compared with the volume of payments effected between private individuals and the socialist sector, so that private transactions can be treated as negligible or almost as a secondary determinant of the total cash circulation. Cash circulation in a planned economy may be regarded in the first approximation as that portion of personal incomes which has not yet been spent. The typical movement of money in a planned economy is not circulation in the proper sense but an outflow from and return to the central bank. Cash flows to the population from the issuing bank through firms and state organizations in the form of wages, payments for agricultural products, or other income. The bulk of income is spent in the socialist sector, in purchases from socialist trading organizations or payments for various services (transportation, gas, electricity, &c.). State organs are obliged to pass on cash to the central bank on the day on which they receive it.

The volume of cash circulation in planned economies is determined by the proportion of the national output which is paid out as personal income and by the rate at which incomes are spent. This rate depends primarily on the income distribution, the level of real wages, and on the availability of a supply of goods for retail trade which is adequate both in total quantity and in qualitative composition to re-attract the purchasing power issued to the population. The cash circulation shows fluctuations (other than the usual seasonal movements) if there are changes in the relationships within the planned economy.

It is possible, therefore, by suitable analysis of changes in cash circulation to draw conclusions about the distribution of the national income, the level of real wages, and the ratio of the available stocks of goods to the volume of purchasing power. There are, of course, other means of observing the development of these aspects of a planned economy. There is, however, a special significance in approaching the analysis by means of the cash circulation, because the latter is not easily influenced by

administrative measures. In a planned economy administrative interference is liable to conceal the true relationships between parts of the economy; the circulation of cash mercilessly exposes any disproportions. In the following pages several important features of the Hungarian economy are analysed in the light of the cash circulation for a period starting with the beginning of the 5-year plan in 1950 and extending to 1958.

In the first years of the 5-year plan the cash circulation did not change (apart from seasonal fluctuations), though the national income was increasing rapidly because of the forced industrialization. In four successive years (1950–3) the average cash circulation over the month of June stood around 2,800 million forints.[1] Rapid industrialization was accompanied by a sharp increase in the employed working population. The additional labour force was recruited partly from the peasantry, partly by the liquidation of small independent producers and traders which was still proceeding at that time, and partly by a considerable growth in the employment of women. The higher volume of wage payments which flowed out to the larger number of employees should have increased the cash circulation. However, other factors acted in the opposite direction and counterbalanced the tendency of larger wage payments to increase the cash circulation.

1. In the first 2 years of the 5-year plan the large-scale liquidation of the private sector exerted a strong tendency to diminish the cash circulation. Those belonging to this stratum lived, for a while at least, from their earlier incomes (or the liquidation of their property), i.e. they spent more (at the expense of their cash holdings) than their current earnings.

2. During these years an ever-increasing share of the national income was allocated to investment, while the share of consumption diminished. In February 1951 the second Party Congress raised the total investment of the 5-year plan from the 51,000 million forints originally foreseen to some 80,000 million forints. According to the original scheme about 30 per cent. of the national income (in terms of the Marxist concept) was to be devoted to investment and some 70 per cent. to consumption. Subsequently (after July 1953) it was admitted that the share of consumption had been temporarily reduced to 58 per cent., i.e. the share of investment had risen to 42 per cent. This operation could be managed without any inflationary pressure as the wages could be held at an appropriately low level.

3. Of the reduced share of consumption a large proportion consisted of social services not involving cash payments; this factor also tended to reduce the circulation of cash.

[1] Data on cash circulation and the stocks of commodities were published in the November–December 1956 issue of the *Közgazdasági Szemle*, pp. 1300–27.

4. Though the total volume of wage payments increased, the average paid per wage earner diminished sharply. According to statistics published subsequently (in 1956) real wages in 1952 were 10 per cent. lower than at the beginning of the 5-year plan. The official figures, however, give an unduly favourable impression; thus in the computation of price indices, insufficient account was taken of the deterioration in the quality of goods. The decline in real wages in the first 3 years of the 5-year plan was at least 20 to 30 per cent. The fall in the purchasing power of wages reached major proportions (apart from the deterioration in the quality of goods) in 1951 when rationing was introduced and urban workers were compelled to purchase most of their requirements of food on the free peasant markets where prices doubled in a short time. This was temporarily helpful for those peasants who had surplus products and lived near the urban markets, but sharply reduced the real incomes of workers. The major part of wages had to be spent on food and as a result the rate at which wages were spent increased. This process was accentuated by the wage and price adjustment of December 1951, which did indeed abolish rationing (and thus reduced free market prices and diminished the importance of the free market in general), but at the same time raised retail prices in the socialist sector by some 40 per cent., and only partially compensated the workers with a wage increase of about 20 per cent. The reserves of cash in the hands of the population diminished in value and the rate at which wages were spent was further accelerated. The amount of cash in circulation remained unchanged even though 20 per cent. more was being paid out in money wages than formerly.

5. The consequences of the wage and price adjustment of 1951 were even more serious for the peasantry. The raising of retail prices was of course also a blow to the peasants, but they did not receive compensation to the extent of 20 per cent. On the contrary, their money incomes were reduced because the scales on which forced deliveries were levied were increased and made more progressive with the size of the farm. As a result of all this a flight of peasants from the land began. In autumn 1952 about 1 million 'hold' (1·42 million acres, roughly 10 per cent. of the total arable area) remained uncultivated. Animal husbandry ceased to be profitable and a reduction of the stock of animals (especially pigs) began. The reserves of cash held by peasants were declining.

It is evident from what has been said that the first 3 years of the 5-year plan brought Hungary to the brink of economic ruin. The workers' standard of life was drastically reduced, large numbers of peasants were leaving the land. On the other hand, the new industrial investments, for the sake of which the country's energies had been drained, were of dubious value. As a result of these investments a faulty industrial structure had

developed. Several traditional, successful branches of industry had been neglected in favour of an extension of heavy industry which had no basis in local supplies of raw materials or energy. In imitation of the U.S.S.R. Hungary pursued for several years a policy of economic autarky which, however, given the unsuitable circumstances, resulted in ever-increasing foreign indebtedness.

It was under these conditions that the Rakosi government was succeeded, in July 1953, by the first government of Imre Nagy. The change brought with it a drastic redirection of economic policy. The rate of investment was reduced; many projects which had been started were abandoned. Correspondingly, the fraction of the national income devoted to consumption increased. The diminution in wages and peasant incomes which had continued for years ceased; wages were increased. The forced contributions of workers and other employees to state loans were reduced. The forced deliveries of farm output were reduced, and the prices paid for these deliveries were raised. Retail prices were slightly reduced. As a result of the increase in real wages the demand for durable consumption goods rose, the cash reserve held by the population grew, the rate at which incomes were spent fell. The cash circulation rose steeply and suddenly. In June 1954 it was some 25 per cent. higher than a year before. The increase in peasant incomes had a particularly great influence on the cash circulation, since peasant incomes are spent at the slowest rate, and the largest holdings of cash are found among the wealthier strata of the peasantry. A factor which slowed down the rate at which cash acquired by the peasants streamed back to the issuing bank was the resumption of trading between peasants (in cattle, fodder, land, &c.) which resulted from the ending of forced collectivization and a growing sense of security. Though the volume of transactions involved cannot have exceeded 3 or 4 per cent. of the total national volume of transactions, it contributed, owing to the slow velocity of circulation of peasant incomes, to the increase of cash circulation.

Finally, the change in the ratio of purchasing power to the stock of goods helped to increase the cash circulation. Before July 1953 incomes had been so depressed that the output of consumption goods was ample in relation to the small demand. The stock of goods in the hands of the state or co-operative trading organizations amounted to almost three times the purchasing power held by the population. After 1953 this situation changed drastically, because demand shot up owing to the increased incomes, while the output of consumption goods could only be gradually increased and failed for a long time to keep pace with demand. This led to the rapid exhaustion of stocks. By the spring of 1954 the stock of goods was less than twice as great as the purchasing power. This degree

of coverage was insufficient if only because as the stock of goods is diminished, supply of the articles most in demand is always the first to run out. An increasing proportion of the total stock of goods comes to consist of unsaleable ones, i.e. the qualitative composition of the stock of goods deteriorates. In 1954 shortages of many kinds developed—clothing, furniture, and other consumption goods (e.g. motor-cycles); above all, however, in building materials which were much sought after by the peasants. The sums which had been put aside for purchasing the unobtainable goods remained unspent. The total amount of cash which would immediately have returned to the issuing bank if suitable goods had become available may be estimated at some 10 or 15 per cent. of the cash circulation.

In March 1955 (after the return of the Rakosi government) there was a further change. The rise in wages stopped, and the compulsory subscriptions to state loans were increased once more. The output of consumption goods was growing; the number of goods in short supply decreased (though some shortages, especially of building materials, have never been eliminated). In the autumn of 1956, just before the uprising, the ratio of the stocks of consumption goods to the volume of purchasing power had again risen to about 3. The rate of growth of the cash circulation was diminishing (the usual seasonal dip in the cash circulation was noticeable in autumn 1955) within the general rising trend for the first time after 2 years. The cash circulation nevertheless continued to grow faster than the national income. The main reason was that an ever-increasing proportion of the national income accrued to the peasants. Quotas for the forced deliveries of farm products were left unaltered at the less onerous levels fixed in 1953. This arrangement in effect raised permanently the price paid for the agricultural produce purchased in addition to forced deliveries, even in years when the harvest was good—as in 1955—and the supply available did not justify the increased price. This was necessary because the state never had reserves at its disposal at the beginning of the agricultural year. The quantities realized from the forced deliveries were insufficient to assure the provisioning of the cities and the fulfilment of export contracts. The state was thus compelled to raise prices in order to gain possession rapidly of the required agricultural products. A good harvest, therefore, depressed prices only of perishable goods, such as fruit and vegetables. So far as other products were concerned, the peasants realized a higher income both through higher prices and through increased quantities. Peasants' incomes are always spent more slowly—as we have seen—than those of urban workers. As their incomes increase, the rate at which peasants spend is slowed down even more; the amount of cash held by the peasants greatly increased in 1955 and 1956. Calculations regarding the position

in the summer of 1956 showed that 1½ million peasant households held about 61 per cent. of the cash in circulation, while wage- and salary-earners, who outnumbered the peasants, held only 22 per cent. The remainder of the cash in circulation was in the hands of others, mainly the private small industrial sector (about 11 per cent.) and the socialist sector (about 6 per cent.). Most of the cash held by the peasants was concentrated among a few hundred thousand wealthier peasants.

The uprising of October 1956 created a new situation also in regard to the circulation of money and the distribution of the national income. During the revolution and in the following months, when there were widespread strikes, wages were paid even while production was interrupted. The stocks of goods for home consumption rapidly fell from some 14,200 million forints to about half this value. Cash circulation rose from 5,500 millions to 7,000 millions in a few months. Thus the purchasing power in the hands of the population came to equal the value of the stocks of goods available. This 1:1 ratio is, as explained above, totally inadequate. At the beginning of 1957 shortages became serious, the rate at which incomes were spent slowed down dangerously, and reserves of cash held increased. Moreover, in the atmosphere prevailing after the revolution wages and salaries had to be raised for political reasons (according to the official figures they were raised by 14 per cent. on the average). In addition the abolition of forced deliveries (one of the reforms of the revolution) was not rescinded.

In spite of the destruction caused by the revolution, consumption thus increased during 1957. To make this possible it was necessary in the first place for Hungary to take up substantial loans (some 1,100 million rubles, worth 275 million dollars at world market prices) from the Soviet Union and other countries of the Soviet bloc. By means of these loans it was possible to replenish the stocks of consumption goods for the home market, improve the supply of raw materials for industry, and secure a reserve of agricultural products to strengthen the bargaining power of the state at the beginning of the 1957 drive for purchasing the peasants' output. To meet the cost of the increase in consumption, some reduction of investment was needed in addition to the foreign loans. In 1957 investment to a value of some 8,500 million forints was undertaken (compared with 12,000 in 1955), i.e. roughly 10 per cent. of the national income. Of this reduced amount, a larger part was spent on housing. Owing to the high percentage of the national income devoted to consumption, or rather the higher level of real wages, the cash circulation remained high even when stocks had been replenished and did not fall much below the level of 7,000 million forints which had been reached shortly after the revolution. This was about 20 per cent. above the pre-revolutionary level.

The years since 1950 may be divided, for the study of cash circulation, into three sharply distinguishable periods. Before July 1953 the movements of cash circulation reflected a deflationary situation. Wages were kept so low that the small supply of consumption goods restricted by the high rate of investment was adequate to meet the effective demand. Between July 1953 and October 1956 a better balance between consumption and investment, and a healthier ratio between national income and cash circulation developed in spite of the difficulties and fluctuations which were described above.

Since 1956 there has been a pronounced inflationary situation in Hungary. In 1957 the total resources of consumption and investment exceeded the national output in spite of the reduction of investment; this was possible only by means of increased foreign indebtedness. The additional foreign loans taken up in 1958 were so small that they represented no significant contribution towards surmounting the inflationary difficulties. On the other hand, investment had to be kept at such a low level that Hungary's economic development was retarded compared with other Eastern European countries. Later in 1958 the investments were increased, shortages of some consumption goods occurred again, and the cash circulation began to rise once more. The economic plan for 1959 again raised the share of investment in the national output. However, the percentage is still lower than in the planned economies of Eastern Europe, but in view of the high level of Hungarian incomes it represents a great burden on the distribution of the national income. If it were desired to raise the rate of investment even farther, it would be necessary either to reduce real wages, to accept the risk of inflationary erosion of monetary values, or to incur debts abroad. Some inflationary tension is already implied in the economic plan for 1959: the new decision of the party to accelerate the fulfilment of the 3-year plan aggravates this tension even more.

LONDON

A NOTE ON THE MEASUREMENT OF REAL INCOME[1]

By STANISLAW WELLISZ

In a recent article[2] Professor Hicks has presented a revision of his famous 1940 paper on the valuation of real income.[3] The revision takes into account the objections raised against the earlier paper by 'new welfare economists',[4] and re-examines the possibility of utility measurement in real (i.e. commodity) terms.

Referring to measurement of the utility of a single individual, Professor Hicks notes that a different result is obtained depending on the composition of the bundle of goods taken as a measuring rod. When society's welfare is being measured, further difficulties arise because of possible income redistribution effects. Professor Hicks attempts to show how these difficulties can be overcome (1) by subdividing society into discrete groups whose members are homogeneous with respect to the change under consideration, and (2) by taking explicitly into account the income effects on each group.

The purpose of this note is to show that the procedure outlined by Professor Hicks does not result in meaningful measurement of real income in the utility sense.[5] The note will lean heavily on Professor Hicks's presentation and no attempt will be made to develop the argument *ab ovo*. To facilitate reference to Professor Hicks's text, the same symbols are used as in the original article.

I

Following Professor Hicks's presentation, consider first the problem of measuring the welfare of one individual (or of a 'composite' individual treated as a single welfare unit) operating in a market environment.

Imagine that there are only two goods, G and H, which the individual purchases in a perfect market. Let the individual have a budget repre-

[1] I am indebted to Professor Lawrence Fisher of the University of Chicago for his helpful criticism of this note.

[2] J. R. Hicks, 'The Measurement of Real Income', *Oxford Economic Papers*, vol. x (1958), hereafter cited as MRI.

[3] 'The Valuation of Social Income', *Economica*, N.S. vol. vii (1940).

[4] See Paul Samuelson, 'Evaluation of Real Income', *Oxford Economic Papers*, N.S. vol. ii (1950).

[5] The discussion will be confined to selected points of special interest to welfare economics. We shall omit all reference to Professor Hicks's treatment of relative merits of quantity-weighted and price-weighted indexes which occupy a considerable portion of the original paper.

sented by $c_1 d_1$ in Fig. 1.[1] The individual chooses the best possible combination of goods G and H subject to market prices and to his budgetary limitations. Diagrammatically the relative prices of G and H are represented by the ratio Od_1/Oc_1.

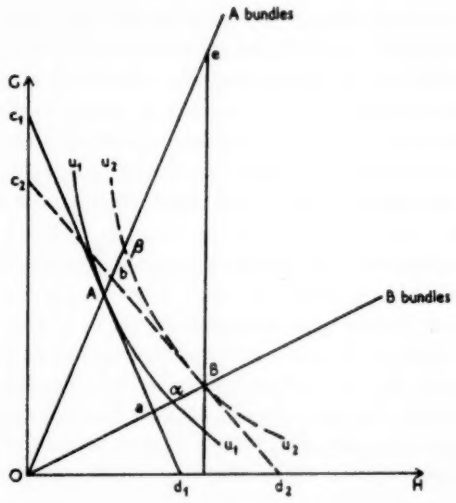

FIG. 1

Let us now change the individual's budgetary restraint, and also the relative prices, so that now the line $c_2 d_2$ represents the new budget and Od_2/Oc_2 the new price relations. Imagine, furthermore, that before the change the individual's choice fell on purchase basket A and after the change on purchase basket B. Observing the two purchase baskets, what can we say about the change in our individual's real income?

If by an individual's real income we mean his utility, and if we are content with an ordinal measure of an individual's utility, we can determine (in most cases) the direction of change by computing price-weighted Laspeyre (L) and Paasche (P) indices. The two indices tell us (respectively) how many goods the individual could have purchased in situation B if A prices were in effect at time B, and how many goods he could have purchased at time A if he were faced by B prices. Since (as can be easily shown) the L index is greater than, or equal to, the P index, the answer is unambiguous except if L increases while P decreases.

[1] The diagrammatic representation adopted in this note is likely to be more familiar to the reader than that used by Professor Hicks. The two representations are equivalent, however, as can be readily seen by transforming the axes.

Diagrammatically the measurement of ordinal utility in terms of L and P indices can be shown as follows:

In Fig. 1 draw a half-ray from the origin through point A and a half-ray from the origin through point B. Label a the intersection of the budget line $c_1 d_1$ with the half-ray OA, and b the intersection of the budget line $c_2 d_2$ with the half-ray OB. It may be readily seen that OB/Oa is the price-weighted L index, and Ob/OA the price-weighted P index.

To relate the indices to utility changes, observe that points A and B lie (by assumption of consumer rationality) at the point of tangency of the respective budget lines with the highest attainable indifference curves. Label these two indifference curves $U_1 U_1$ and $U_2 U_2$ respectively. $U_1 U_1$ and $U_2 U_2$ must be non-intersecting if the individual has a consistent ranking of commodities.

Label α the intersection of the utility curve $U_1 U_1$ with the ray OB and β the intersection of $U_2 U_2$ with OA. Now if $OB > Oa$ (i.e. the L index is higher in situation B than in A) we can be sure that α lies between a and B. Since α is equivalent to A from the consumer's utility point of view, and since B is better than α (because it represents more of all commodities), B is preferable to A, i.e. the individual's income is higher at B than at A, the measurement being made in B bundles. Likewise if the P index is higher at B than at A, i.e. $Ob > OA$, then since β must lie beyond b on ray OA, real income is higher at B than at A measured in A bundles. If L is greater at B than at A while P is less at B than at A no comparison can be made between A income and B income. The reason for this is that the indices indicate the range within which the indifference curves must pass, but not the exact position of the curves.

The ambiguity in measurement becomes greater if we attempt to attach a cardinal meaning to real income. In the words of Professor Hicks:

> That there are two price-weighted indices, according as we work from A towards B or from B towards A is very familiar. What is less familiar, though it is made quite clear from our diagram, is that there are two utility measures also. The same change (from one indifference level to another) is measured by OB/O if we work in terms of B bundles, and by O/OA if we work in terms of A bundles. There is no single measure of real income. Every measure is infected by relativity; every measure depends upon the point of view from which the measure is taken.[1]

Professor Hicks calls the utility index $OB/O\alpha$ the p index, and $O\beta/OA$ the l index. He further notes that if the individual has a consistent preference map for goods, then $L \geqslant p$ and $l \geqslant P$. This modification weakens the case for saying that the utility change lies 'between' the L and P indices:

> Consider the case (common enough in practice) where the two price-weighted indices (L and P) give quite harmonious results. Each of them (let us say) registers

[1] MRI, p. 139.

a rise of 5 per cent. We can then deduce from the above argument that the Laspeyre utility index (if we could find it) must register a rise of at least 5 per cent.; and that the Paasche utility index (which must move in the same direction) must rise by something between 0 and 5 per cent. . . . It is entirely possible, on the figures given, that I might show a big rise (say 20 or 30 per cent.) while p showed scarcely any rise at all.[1]

The proposition that Paasche and Laspeyre indices do not give the boundaries of a single and unambiguous welfare index has been repeatedly advanced in the last 20 years,[2] but its implications to welfare economics have not been sufficiently emphasized. Professor Hicks justly points out that every measure of utility in commodity terms is relative to the composition of the commodity bundle used as a measuring rod. Thus even if we could define for a single individual a cardinal utility function, we could not use a commodity measure of utility levels. This, indeed, is a grave condemnation of commodity measurements of cardinal utility.

II

While Professor Hicks notes that a commodity bundle measure of an individual's cardinal utility is ambiguous, he does not reject outright such a measure of utility. His acceptance of the commodity bundle measure may be justified on two grounds. First, the measure is meaningful if we realize that it is relative to the bundle chosen as measuring rod. Second (and more important), no 'absolute' measure is available.

The application of the commodity bundle measuring rod to a community of individuals not all of whom constitute a single welfare unit entails further difficulties which Professor Hicks does not treat in his article. As we shall see it is not sufficient to specify the measuring rod to obtain a meaningful measure of community income. The relation between the measuring rod and what is being measured is itself subject to change, and we lack any instrument to measure that change. The difficulty flows from the heterogeneity of a community, and it arises even if income distribution is held constant.

Imagine that at prices $c_1 d_1$ and at time A individual 1 consumes a bundle $A1$, and individual 2 a bundle $A2$ (see Fig. 2). Imagine, further, that at time B the two individuals consume $B1$ and $B2$ respectively, the relative prices remaining unchanged. Let the total purchases of the two individuals amount to a bundle A at time A and to a bundle B at time B. For the sake of simplicity assume that B lies on the OA ray, so that the

[1] MRI, p. 141.

[2] The fact that different price-commodity indices refer to different utility indices has been brought up clearly in the discussion of the Konüs index. See Henry Schultz, 'A Misunderstanding in the Index Number Theory: The True Konüs Condition on Cost-of-Living Index Numbers and its Limitations', *Econometrica*, vol. vii (1939), and Bruce D. Mudgett, 'The Cost of Living and Konüs' Condition', *Econometrica*, vol. xiii (1945).

measure of total cardinal welfare for the community can be carried out unambiguously in A bundles. The question which we want to investigate is whether the measurement in A bundles gives an unbiased appraisal of the (cardinal) welfare of 1 and 2.

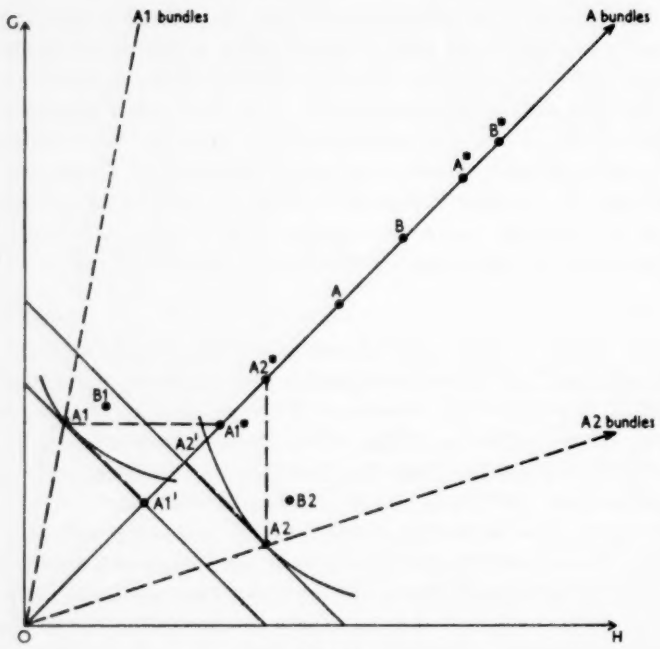

FIG. 2

The welfare of 1 taken in isolation can be measured, as we have seen, either in $A1$ bundles or in $B1$ bundles, the results being different depending on the bundle chosen. The question which we wish to answer is what is the relation of either of those measures to an A bundle measure.

Consider the point $A1$ on the $OA1$ ray. What point on the OA ray is indifferent to it from individual 1's point of view? Since we cannot observe directly the indifference curve passing through $A1$, we must content ourselves with the specification of limits within which the indifferent point must lie. These limits are $A1'$ and $A1^*$. The point $A1'$ lies on the OA ray and on the first individual's budget line. Since $A1'$ was rejected in favour of $A1$, $A1$ must be preferred to it. Point $A1^*$ lies on the OA ray and contains at least as much of each good as point $A1$, hence it must be preferred to $A1$. By the same reasoning $A2$ is at least as good as $A2'$ and inferior to $A2^*$.

Now in saying that A represents the utility level of individuals 1 and 2

taken together, we take a summation along ray OA, that is, we sum up the commodity totals represented by points $A1'$ and $A2'$. These points, as we have seen, represent the lower limit of utility of bundles $A1$ and $A2$. The upper limit of utility is represented by A^*, obtained by summing up the commodity bundles $A1^*$ and $A2^*$.

An estimate of community income made on the basis of a single commodity-bundle rod (such as A) will therefore be always biased downward. There are only two (rather insignificant) exceptions to this observation. The estimate is unbiased if all individuals consume all goods in the same proportions or if for all individuals the rate of commodity substitution is constant and equal to the ruling price ratios, i.e. if the individuals' indifference lines coincide with the price lines. The greater the difference in the composition of purchase bundles, the less the elasticity of substitution among goods, the greater the bias of the commodity bundle measurement.

By following the same train of thought we can show that the community's real income in the B situation can be represented by some point falling between B and B^*. The B measure will (in general) underestimate real income, while the B^* measure will (in general) overestimate it.

If in situation B the community's bundles of purchases have the same composition as in situation A we shall be able to use A as a measuring rod in both situations.[1] Unfortunately, the degree of bias of the A measure will be the same in the A and the B situation if and only if (1) $B1$ lies on the $OA1$ ray and $B2$ on the $OB2$ ray and, at the same time the curvature of the indifference curves passing through the B points is the same for every ray through the origin as the curvature of the indifference curves passing through the A points, or (2) if $A1$ coincides with $A2$ and $B1$ with $B2$. Condition (1) amounts to saying that the degree of bias does not change if all goods have unit income elasticity of demand for each individual at all possible prices. Condition (2) means that all individuals have exactly the same incomes and tastes.

In the general case neither condition (1) nor condition (2) will be satisfied. Not all goods have unit income elasticity of demand. Not all individuals receive the same income. Not all individuals who receive the same income have the same taste. Since the violation of just one condition suffices to create differences in dispersion of individual purchase baskets as relative prices or incomes change, the degree of bias will change also. In general the greater the dispersion, the greater the extent to which a single commodity bundle measure will underestimate individual welfare changes. It follows, therefore, that a commodity bundle estimate of national income will generally be biased as well as erratic.

[1] If A and B lie on different rays, we shall encounter all the difficulties discussed in section I above.

III

Except in some trivial cases any policy change makes some individuals better off while others are made worse off. To say whether the community as a whole is better off or worse off as a result of the change, we must weigh in some fashion the gains against the losses. In his new paper Professor

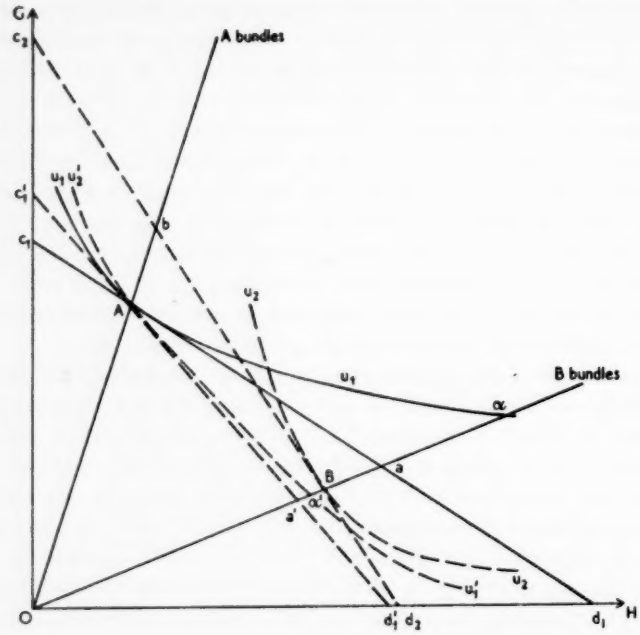

FIG. 3

Hicks proposes a new method of comparison which he believes to be free from the defects inherent in the earlier 'compensation' method.[1] The remaining portion of this note will be devoted to a description and to a critical appraisal of Professor Hicks's proposal.

Fig. 3 which represents the collective situation is constructed in a fashion analogous to Fig. 1. As in the case of a single individual, we wish to compare positions A and B. Now while in the individual case it is inadmissible that position B should lie within the budget line $c_1 d_1$ while position A lies simultaneously within the budget line $c_2 d_2$, such a case may occur in a collective situation because A and B represent different income distributions. To use an oft-quoted example: if income is taken away from the rich and given to the poor, prices of luxuries *and* consumption of luxuries

[1] See Paul Samuelson, loc. cit.

may fall, while prices of necessities *and* consumption of necessities may rise.

By an argument analogous to that developed for the single individual points A and B are points of tangency of the community price-budget lines $c_1 d_1$ and $c_2 d_2$ and the 'community indifference curves' $U_1 U_1$ and $U_2 U_2$ respectively. These 'community indifference curves' (often called 'Scitovszky contours')[1] represent positions in the commodity space such that each member of the community remains at a pre-assigned utility level. If income distributions are different, the Scitovszky contours may cross, hence the difficulty of deciding whether A or B is a superior position.

Professor Hicks proposes to get around this difficulty by dividing the analysis into two steps. In the first step income is redistributed without changing the aggregate income level; in the second step the aggregate income level is changed without further redistribution.

Draw through point A a Scitovszky contour for an income distribution prevailing in position B. This contour, labelled $U_1' U_1'$, *cannot* intersect with the frontier $U_2 U_2$ because the two contours refer to the same income distribution, and it would be a sign of consumer inconsistency if they did cross.[2] Draw also a new price line $c_1' d_1'$ through A, tangent to the new Scitovszky contour at A. Let the new price line cross the OB half-ray at a'. Then if Oa', Oa, OB/Oa', OB/Oa. Now $OB/Oa = L$, hence L_0 defined as OB/Oa' is greater than L. The discrepancy between the two indices measures the redistribution effect on prices. Having measured that effect, we may proceed to compare real income levels at distribution B.

The procedure outlined by Professor Hicks gives rise to a number of objections.

The first objection concerns the concept of redistribution as such. There is no guarantee that we *could* redistribute income in situation A to conform to the pattern B. Such redistribution might be impossible for two reasons. First of all, it might not be permitted without changing the institutional framework. If, for instance, competition prevails in the system at both times, i.e. the same system gives income distributions A and purchase of bundles A at time A and income distribution B and bundle of purchases B at time B, it makes little sense to build a hypothetical situation such that the competitively produced bundle A would be distributed by some other mode (say by a dictator), in the pattern B. Secondly, there is no guarantee

[1] The name 'Scitovszky contours' was first used by J. De Villiers Graaf in his *Theoretical Welfare Economics* to indicate the type of community indifference contours developed in Scitovszky's 'A Reconsideration of the Theory of Tariffs', *Review of Economic Studies*, vol. x (1942).

[2] Note, however, that the fact that $U_1' U_1'$ lies closer to the origin than $U_2 U_2$ tells us nothing about the social ranking of $U_1 U_1$ and $U_2 U_2$. $U_1' U_1'$ and $U_1 U_1$ are incommensurable since they refer to different income distributions.

whatever that we *could* redistribute income without changing the composition of the bundle itself. To do so, we would have to assume that all factors are in completely inelastic supply and that there are no possibilities of changing the product mix. To be sure, redistribution without change in product mix or in factor supply could be made, say, within a besieged city entirely supplied by parcels from the air. Most peace-time measures which could be contemplated (and that includes the old favourite of welfare economists, the lump-sum redistribution of wealth) would cause a change in the size and composition of the product bundle.

A second major difficulty concerns the meaning of the 'same' income distributions when the size and composition of the bundle changes. How can one distribute 1,000 oranges and 100 eggs in the 'same' fashion as, say, 800 oranges and 150 eggs? To do so we should somehow attempt to increase (or reduce) everybody's welfare 'in the same degree', but this cannot be done without inter-personal welfare comparisons. Thus there is no way of redistributing (even hypothetically) the A incomes in the B pattern, unless, perchance, A happened to lie on the Scitovszky contour drawn for B income distributions, i.e. unless A and B were indifferent to *all* members of the community.[1]

A final point concerns Professor Hicks's reliance on a single standard of comparison between positions A and B. There is no logical reason why the comparison should not be made by taking an intermediate position in which B bundles would be distributed in accordance with the A income distribution. We could also draw through B a Scitovszky contour $U_2' U_2'$ which will not intersect the frontier $U_1 U_1$ since both will refer to the same distribution. In the case presented in Fig. 3 this means that the B position is superior to the A position. But by starting from A we have proved just the contrary. Thus the dilemma remains unresolved, and we are no more advanced than we were at the start of the elaborate calculations.

IV

An examination of Professor Hicks's proposal to employ a commodity bundle measure of community welfare has led us to complete rejection of the measure. The first reason for the rejection is advanced by Professor Hicks himself: the measure changes with the measuring rod, even if we confine our attention to the welfare of a single individual. In the second place, the application of the commodity bundle measure to a society

[1] This objection applies to all sorts of situations, and not just to the situation in which the P and L indices behave in a perverse fashion. In fact unless comparisons between situations A and B can be made on pure Paretan principles, to make any comparison at all we must be sure that an income redistribution is legitimate. On this point see Martin J. Bailey, 'The Interpretation and Application of the Compensation Principle', *Journal of Political Economy*, vol. lxiv (1954).

composed of more than one individual gives a bias to the measuring rod and makes the measure erratic. It does not help matters to subdivide society into groups homogeneous in respect to taste. The measure will be biased and erratic for a perfectly homogeneous group unless all the members' incomes are equal, or all goods have a unit income elasticity of demand.

The proposal for a method of comparing two situations in which different bundles of goods are purchased and in which income distribution differs is also unacceptable. The essence of the proposal is to consider a 'half-way station' between two situations A and B. At that station A goods would be distributed in the B fashion. As we have argued in this note, (1) it is meaningless to say that two different incomes are distributed 'in the same fashion', (2) the composition of the bundle changes if the bundle is redistributed, and (3) the results of the procedure differ depending on whether we measure from A toward B or from B toward A. The problem of finding a cardinal measure of real income remains to be solved—if indeed it has a solution.

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